

Mass and Elite Views on Nuclear Security

US National
Security Surveys
1993–1999

Volume I: General Public

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Abstract

This is the fourth report in an ongoing series of studies examining how US perspectives about nuclear security are evolving in the post-Cold War era. In Volume I we present findings from a nationwide telephone survey of randomly selected members of the US general public conducted from 13 September to 14 October 1999. Results are compared to findings from previous surveys in this series conducted in 1993, 1995, and 1997, and trends are analyzed.

Key areas of investigation reported in Volume I include evolving perceptions of nuclear weapons risks and benefits, preferences for related policy and spending issues, and views about three emerging issue areas: deterrent utility of precision guided munitions; response options to attacks in which mass casualty weapons are used; and expectations about national missile defenses.

In this volume we relate respondent beliefs about nuclear security to perceptions of nuclear risks and benefits and to policy preferences. We develop causal models to partially explain key preferences, and we employ cluster analysis to group respondents into four policy relevant clusters characterized by similar views and preferences about nuclear security within each cluster. Systematic links are found among respondent demographic characteristics, perceptions of nuclear risks and benefits, policy beliefs, and security policy and spending preferences.

In Volume II we provide analysis of in-depth interviews with fifty members of the US security policy community.

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Volume I: Executive Summary

Chapter One: Introduction and Overview

This is the first volume of a two-volume report summarizing findings from an ongoing research project to study mass and elite views about nuclear security in the post-Cold War environment. In Volume I we analyze results from a nationwide survey of the general public conducted between 13 September and 14 October 1999. We compare findings with those from three previous surveys of the general public conducted in 1993, 1995, and 1997. In Volume II we comparatively analyze views about nuclear security expressed during in-depth interviews with fifty members of the US security policy community between 3 June 1999 and 1 March 2000. The following table outlines our ongoing study series.

	PHASE I	PHASE II	PHASE III	PHASE IV
COLLECTION PERIODS	June 1993– March 1994	September– November 1995	June– November 1997	Survey: September– October 1999 Interviews: June 1999– March 2000
RESPONDENT GROUPS	<ul style="list-style-type: none"> • General Public: <i>N = 1,301</i> • Union of Con- cerned Scientists: <i>N = 1,155</i> • US National Labs: <i>N = 1,226</i> 	<ul style="list-style-type: none"> • General Public: <i>N = 2,490</i> 	<ul style="list-style-type: none"> • General Public: <i>N = 1,639</i> • American Men & Women of Science: <i>N = 1,212</i> • State Legislators: <i>N = 603</i> 	<ul style="list-style-type: none"> • General Public: <i>N = 1,483</i> • Policy Elites: <i>N = 50</i>
COLLECTION METHODS	<ul style="list-style-type: none"> • General Public <i>Telephone</i> • Union of Con- cerned Scientists: <i>Mail</i> • US National Labs: <i>Mail</i> 	<ul style="list-style-type: none"> • General Public: <i>Telephone</i> 	<ul style="list-style-type: none"> • General Public: <i>Telephone</i> • American Men & Women of Science: <i>Mail</i> • State Legislators: <i>Mail</i> 	<ul style="list-style-type: none"> • General Public: <i>Telephone</i> • Policy Elites: <i>Face-to-face Interviews</i>
KEY LINES OF INVESTIGATION	<ul style="list-style-type: none"> • Nuclear security • Philosophical approaches to science and research 	<ul style="list-style-type: none"> • Nuclear security • US/Russian nu- clear cooperation • Personal security 	<ul style="list-style-type: none"> • Nuclear security • US/Russian nu- clear cooperation • Critical infrastruc- tures • Science policy 	<ul style="list-style-type: none"> • Nuclear security • Precision guided munitions • Response options • National missile defenses

Chapter Two: Trends in Risk and Benefit Perceptions

Security Environment (p. 9): Members of the general public considered the international security environment and overall US national security to have improved only marginally since the end of the Cold War. China was perceived to have replaced Russia as the chief nuclear threat to the US, and perceptions of the nuclear threats from China and Russia were statistically significantly higher in 1999 than in 1997.

Nuclear Risks (p. 12): As measured by a composite risk index composed of responses to six different questions measuring perceived risks to the US of nuclear conflict, nuclear proliferation, and nuclear terrorism, mean perceptions of *external* nuclear risks increased significantly in 1999 compared to 1997, 1995, and 1993. Mean perceptions of the risks deriving from our own nuclear arsenal, as measured by seven different indicators of the *domestic* risks of managing nuclear weapons, also were higher in 1999 than in 1997, but still were substantially lower than those reported in 1993.

Nuclear Benefits (p. 15): Mean perceptions of *external* benefits resulting from US nuclear weapons as measured by seven different indicators also were higher in 1999 than in 1997, while mean perceptions of *domestic* benefits from US nuclear weapons and military investments as measured by three indicators remained unchanged from earlier periods.

Chapter Three: Trends in Policy and Spending Preferences

Viability of Nuclear Weapons (p. 23): Although most respondents considered a nuclear weapons-free world to be *desirable*, most thought it was not *feasible* in the foreseeable future, and skepticism about the prospects for nuclear abolition was widespread. Since first measured in 1993, mean perceptions of the importance of US nuclear weapons for (a) US status, (b) US influence, (c) preserving America's way of life, (d) the importance of the US remaining a military superpower, and (e) the importance of retaining US nuclear weapons have all trended upward. Valuation of US nuclear weapons has not declined among the general public since the end of the Cold War. To the contrary, such valuations are shown empirically to have increased significantly from 1993 to 1999.

Nuclear Deterrence (p. 28): Comparative measures of the value of nuclear deterrence since 1993 have remained above 7.0 on a scale where zero meant “not at all important,” and ten meant “extremely important.” Respondents highly valued the past and present role of nuclear deterrence, placed substantial faith in the future role of nuclear deterrence (even if more countries acquire nuclear weapons), and considered US nuclear weapons to be important in preventing attacks with other types of mass casualty weapons.

Numbers of Nuclear Weapons (p. 30): When asked in 1997 and 1999 to identify the minimum numerical level to which they would be willing to reduce the US nuclear arsenal in the context of mutual and verified reductions with Russia, the median range in both years was 1,500 to 2,000 nuclear weapons. In both surveys, about 20 percent of respondents preferred zero; about 11 percent preferred no reductions below current levels; about one-fourth of respondents preferred 1,000 nuclear weapons or fewer (but not zero). Almost half of all respondents in each year preferred the START II levels of 3,500 or below (but not zero), while approximately one-third of respondents in each year preferred levels above those of START II.

Investment Preferences (p. 32): Respondents were asked how current spending should change for (a) developing and testing new nuclear weapons; (b) reliably maintaining existing nuclear weapons; (c) research to increase the safety of existing nuclear weapons; (d) training to insure the competence of those who manage nuclear weapons; and (e) maintaining the ability to develop and improve nuclear weapons in the future. The trend in mean responses to each question was decidedly upward, with changes from 1993 to 1999 being highly statistically significant ($p < .0001$) for each question. Also, respondents were asked how they thought spending should change for preventing the spread of nuclear weapons and for preventing nuclear terrorism. Mean responses to each have risen significantly since 1995.

Chapter Four: Emerging Issues

Precision Guided Munitions (p. 45): When asked to assess the degree to which (if any) conventionally armed “smart bombs” could replace nuclear weapons for US deterrence, about one-third of participants rated the potential above midscale, while more than half of respondents rated the replacement value of “smart bombs” below midscale. While there was considerable

doubt about the exchange value of precision guided munitions for nuclear weapons, most respondents considered them to have partial trade-off potential for purposes of deterrence.

Responding to Mass Casualty Attacks (p. 49): When considering responses to attacks against the US, its troops, or its allies in which nuclear, biological, or chemical weapons are used, a majority of respondents indicated they would support the use of US nuclear weapons to retaliate. However, when given three response options—diplomacy only, conventionally armed “smart bombs,” or nuclear weapons—respondents overwhelmingly favored “smart bombs” for responding to biological or chemical attacks against US forces, and a plurality (46 percent) favored “smart bombs” over nuclear weapons for responding to a nuclear attack against US forces. Combined with the data in the previous section, these findings indicate that participants placed considerable value in precision guided munitions both for deterrence and for retaliation should deterrence fail, but that they would support nuclear retaliation under some circumstances.

National Missile Defenses (p. 53): Only 26 percent of respondents correctly understood that the US does not now have national missile defenses (NMD). Misunderstanding was significantly higher among women and younger participants. These results indicate that one of the first requirements of a national debate about NMD is to provide factual information about current US capabilities and vulnerabilities regarding missile defenses. After we informed all participants that the US does not now have the capability to defend against long-range missile attacks, we randomly presented very brief descriptions of some of the arguments on each side of the debate about NMD. Then when asked whether the US should build national missile defenses, 69 percent of respondents favored building them, 19 percent were opposed, and 12 percent were undecided. Mean support for NMD was rated 5.1 on a scale where one meant the US “definitely should not” build a national missile defense system, and seven meant the US “definitely should” build such a system. Support for NMD was statistically significantly higher among men (5.3) than among women (5.0). Opinion was more divided about: (a) whether money for NMD would be better spent on other programs; (b) whether the threat of US nuclear retaliation is sufficient to deter all long-range missile attacks except for accidental launches; and (c) whether national missile defenses will lead to a new arms race with Russia and China.

Chapter Five: Belief Systems and Nuclear Security

Political Beliefs (p. 65): Self-placement on a left–right continuum of political ideology was highly consistent with the same measurements in 1993, 1995, and 1997. Our data show a systematic positive relationship between increasing political conservatism and perceptions of external and domestic benefits thought to derive from the US nuclear arsenal, and a negative relationship between increasing political conservatism and perceptions of domestic nuclear risks. Political ideology was not a reliable predictor across all of our surveys of perceptions about external nuclear risks, but political ideology has consistently been related to security policy and spending issues. As political conservatism increased, assessments of the importance of retaining nuclear weapons, support for increasing funding for nuclear weapons infrastructure, support for a national missile defense system, and support for nuclear retaliation against a country that attacked the US with nuclear weapons all increased. And as conservatism increased, agreement that it is feasible to eliminate all nuclear weapons within the next twenty-five years decreased, as did agreement that “smart bombs” can replace nuclear weapons for purposes of deterrence.

Policy Beliefs (p. 71): Reactions to nine pairs of contrasting assertions about the security environment, nuclear weapons, and the use of force were combined into an index of policy beliefs that was predictive of security perceptions and policy preferences. As respondents’ support for traditional and establishmentarian beliefs about nuclear security increased, so too did their rating of the importance of retaining nuclear weapons and their support of funding for nuclear weapons infrastructure, national missile defenses, and nuclear retaliation. Affinity for traditionalist beliefs was negatively associated with the assertion that it is feasible to eliminate all nuclear weapons in the next twenty-five years and with the degree to which “smart bombs” were thought to have potential for replacing nuclear weapons for purposes of deterrence. Policy beliefs were found to be interactively related with perceptions of nuclear weapons risks and benefits.

Chapter Six: Demographics and Nuclear Security

Age (p. 87): When used as a continuous independent variable in bivariate regressions to predict perceptions of nuclear risks and benefits, age was re-

lated positively to perceptions of external and domestic nuclear benefits and negatively to perceptions of domestic nuclear risks from our own nuclear arsenal. Age was not systematically related to perceptions of external nuclear risks stemming from others' nuclear weapons. When used as the independent variable to predict responses to each of four deterrence valuation questions, age was systematically related, but had very modest explanatory power. We found no evidence of cohort effect that would cause respondents who did not experience the Cold War as adults to value nuclear deterrence differently than those who did experience the Cold War as adults.

When used as the independent variable to predict preferences about each of six policy issues, increasing age was related to (a) higher assessments of the importance of retaining nuclear weapons today; (b) greater support for funding for nuclear research capabilities; (c) lower assessments of the degree to which conventionally armed "smart bombs" can replace nuclear weapons for deterrence; and (d) increasing support for nuclear retaliation against a country that used nuclear weapons against the US. Age was not systematically related to judgments about the feasibility of eliminating all nuclear weapons in the next twenty-five years or to preferences about building national missile defenses.

Gender (p. 97): Women perceived significantly higher external and domestic nuclear risks than did men, but gender was not systematically related to perceptions of external and domestic nuclear benefits. Significant differences between the preferences of men and women were found for some policy issues. Women considered eliminating all nuclear weapons in the next twenty-five years to be more feasible than did men, and they rated the importance of retaining nuclear weapons substantially lower than did men. Women judged the potential higher than men for conventional "smart bombs" to replace nuclear weapons for purposes of deterrence, and women were significantly less supportive of nuclear retaliation against a country that attacked the US with nuclear weapons. Support for funding nuclear weapons research capabilities and for building national missile defenses did not vary significantly by gender.

Education (p. 100): Increasing levels of education were systematically related to decreasing perceptions of external and domestic nuclear risks and benefits. The following changes in policy preferences were associated with increasing levels of education: (a) decreasing assessment that the elimina-

tion of all nuclear weapons in the next twenty-five years is feasible; (b) declining importance of retaining nuclear weapons; (c) decreasing support for funding nuclear weapons research capabilities; (d) declining assessments of the degree to which conventional “smart bombs” can replace nuclear weapons for deterrence; (e) decreasing support for building a national missile defense system; and (f) declining support for nuclear retaliation against a country that used nuclear weapons to attack the US.

Income (p. 104): As income increased, perceptions of the risks from our own nuclear weapons and perception of the domestic benefits from the US nuclear arsenal decreased. Perceptions of external nuclear risks and benefits were not systematically related to income levels. As the level of income increased, (a) perceptions of the feasibility of eliminating all nuclear weapons in the next twenty-five years decreased; (b) assessments of the degree to which conventional “smart bombs” can replace nuclear weapons for deterrence declined; and (c) support for building a national missile defense system decreased.

Chapter Seven: Mapping Public Views About Nuclear Security

Causal Modeling (p. 109): Path analysis was used to develop causal models of responses to a question about the importance of retaining nuclear weapons (Q32) and to a question about how spending should change for maintaining the ability to develop and improve nuclear weapons in the future (Q40). For each question, causal implications of demographic characteristics, political ideology, perceptions of nuclear weapons risks and benefits, and policy core beliefs were calculated, and standardized regression coefficients were used to illustrate the relative effects on responses to each of the two questions. Our causal models explained 42 percent of variation in assessments of the importance of retaining nuclear weapons and 28 percent of variation in preferences for how spending should change for maintaining the ability to develop and improve nuclear weapons in the future. In both models, perceptions of external nuclear benefits proved to be the most influential factor. Our models illustrate that causal relationships explaining substantial portions of the variation in public preferences about key nuclear security issues are consistent with our hypothesized relationships.

Cluster Analysis (p. 119): Cluster analysis was used to identify four policy-relevant groupings of views among respondents. The groups could reliably be placed on a spectrum of views from those most critical of traditional and establishmentarian perspectives about nuclear security to those most supportive of such perspectives. Each respondent was identified with a group based on n -dimensional cluster analysis techniques. Based on group profiles, we were able to reliably predict relative group preferences for a range of nuclear security policy issues. The ability to identify and group members of the general public in ways that are relevant to and predictive of nuclear security policy preferences provides a useful bridge for comparing subgroups of the public to subgroups among policy elites.

Coherence of Public Views (p. 127): We found a high degree of coherence among the views of Americans about the future of nuclear security. Four dimensions of coherence were evident: (a) stability of views over time (temporal coherence); (b) predictable connections among views about complex nuclear security subjects (topical coherence); (c) robust relationships among respondent characteristics, perceptions, beliefs, and policy preference (relational coherence); and (d) distinct groupings of associated beliefs and views that were predictive of security policy preferences (associational coherence). These attributes of public views strongly suggest that, in the aggregate, the American general public exhibits a very substantial capability for participating in and contributing to policy processes for shaping the evolution of nuclear security.

Volume I: Chapter One

Introduction and Overview

THIS IS THE FIRST OF TWO-VOLUMES REPORTING FINDINGS FROM THE fourth phase of our ongoing project to study US public attitudes about post-Cold War security. We conducted previous studies in 1993, 1995, and 1997.¹ Those studies reported findings from three national surveys of the US general public, three surveys of different groups of scientists, and a survey of state legislators from all fifty states. This phase includes a fourth survey of the US general public and findings from fifty in-depth interviews with security policy experts. Cumulatively, our project has included fifteen focus groups and more than 11,000 surveys and interviews with Americans.

Section 1.1: Project Goals

THE GOAL OF THIS PROJECT IS TO MEASURE AND TO BETTER UNDERSTAND the evolution of public and elite attitudes about security in the post-Cold War period, with a special emphasis on how views about nuclear security are changing. Our data allow us to examine two key dimensions of attitudes. First, a significant portion of the four surveys of the US general public are comparative over time. As shown in this volume, they illustrate trends in public perceptions of the security environment and preferences about selected security policy and spending issues. Second, our surveys of scientists and legislators, previously reported, and our interviews with policy experts discussed in Volume II provide comparisons of views about nuclear security

¹ Reports of the three previous studies in this series can be obtained from the National Technical Information Service. See: (1) Hank C. Jenkins-Smith, Richard P. Barke, and Kerry G. Herron, 1994, *Public Perspectives of Nuclear Weapons in the Post-Cold War Environment*. Document ID: SAND94-1265, Albuquerque, NM: Sandia National Laboratories. (2) Kerry G. Herron and Hank C. Jenkins-Smith, 1996, *Evolving Perceptions of Security: US National Security Surveys 1993–1995*. Document ID: SAND96-1173, Albuquerque, NM: Sandia National Laboratories. (3) Kerry G. Herron and Hank C. Jenkins-Smith, 1998, *Public Perspectives on Nuclear Security: US National Security Surveys 1993–1997*, Document ID: SAND98-1707, Albuquerque, NM: Sandia National Laboratories.

among elite groups with those of the general public. Table 1.1 characterizes each of our four studies by collection periods, respondent groups, collection methods, and key lines of investigation.

Table 1.1: Survey Research Series on Post-Cold War Security

	PHASE I	PHASE II	PHASE III	PHASE IV
COLLECTION PERIODS	June 1993– March 1994	September– November 1995	June– November 1997	Survey: September– October 1999 Interviews: June 1999– March 2000
RESPONDENT GROUPS	<ul style="list-style-type: none"> • General Public: <i>N = 1,301</i> • Union of Con- cerned Scientists: <i>N = 1,155</i> • US National Labs: <i>N = 1,226</i> 	<ul style="list-style-type: none"> • General Public: <i>N = 2,490</i> 	<ul style="list-style-type: none"> • General Public: <i>N = 1,639</i> • American Men & Women of Science: <i>N = 1,212</i> • State Legislators: <i>N = 603</i> 	<ul style="list-style-type: none"> • General Public: <i>N = 1,483</i> • Policy Elites: <i>N = 50</i>
COLLECTION METHODS	<ul style="list-style-type: none"> • General Public <i>Telephone</i> • Union of Con- cerned Scientists: <i>Mail</i> • US National Labs: <i>Mail</i> 	<ul style="list-style-type: none"> • General Public: <i>Telephone</i> 	<ul style="list-style-type: none"> • General Public: <i>Telephone</i> • American Men & Women of Science: <i>Mail</i> • State Legislators: <i>Mail</i> 	<ul style="list-style-type: none"> • General Public: <i>Telephone</i> • Policy Elites: <i>Face-to-face</i> <i>Interviews</i>
KEY LINES OF INVESTIGATION	<ul style="list-style-type: none"> • Nuclear security • Philosophical approaches to science and research 	<ul style="list-style-type: none"> • Nuclear security • US/Russian nu- clear cooperation • Personal security 	<ul style="list-style-type: none"> • Nuclear security • US/Russian nu- clear cooperation • Critical infrastruc- tures • Science policy 	<ul style="list-style-type: none"> • Nuclear security • Precision guided munitions • Response options • National missile defenses

Section 1.2: Conceptual Approach

THROUGHOUT THIS PROJECT WE HAVE APPLIED A VARIETY OF RESEARCH methods to better understand the nature of post-Cold War security as interpreted by various US publics. Our phased approach allows us to identify trends and to explore differences in evolving perceptions and preferences about nuclear security. Our focus is on measuring opinions; we do not attempt to draw policy implications from those opinions or to make policy recommendations based on them. All findings are publicly released.

Our 1999 study was designed to provide three types of information:

- Trend analysis of general public views about nuclear security in 1999 compared to national surveys of the general public conducted in 1993, 1995, and 1997. Results are provided in this volume.
- Data from new questions designed to further explore public attitudes about the use of nuclear weapons, the relationship between nuclear weapons and precision guided munitions, and strategic missile defenses. Findings about these issues also are reported in this volume.
- Qualitative analysis of in-depth face-to-face interviews with fifty members of the US security policy community. All policy elites had specialized expertise relevant to security policy, and many previously held policy making positions in government. Findings are reported in Volume II of this report.

To help us design the survey questionnaire, we conducted three focus groups with members of the general public in three different geographic regions. Focus group discussions were conducted in Boston, Massachusetts, Dallas, Texas, and Portland, Oregon. We provide qualitative analysis of the three general public focus groups in Appendix 2 of this volume.

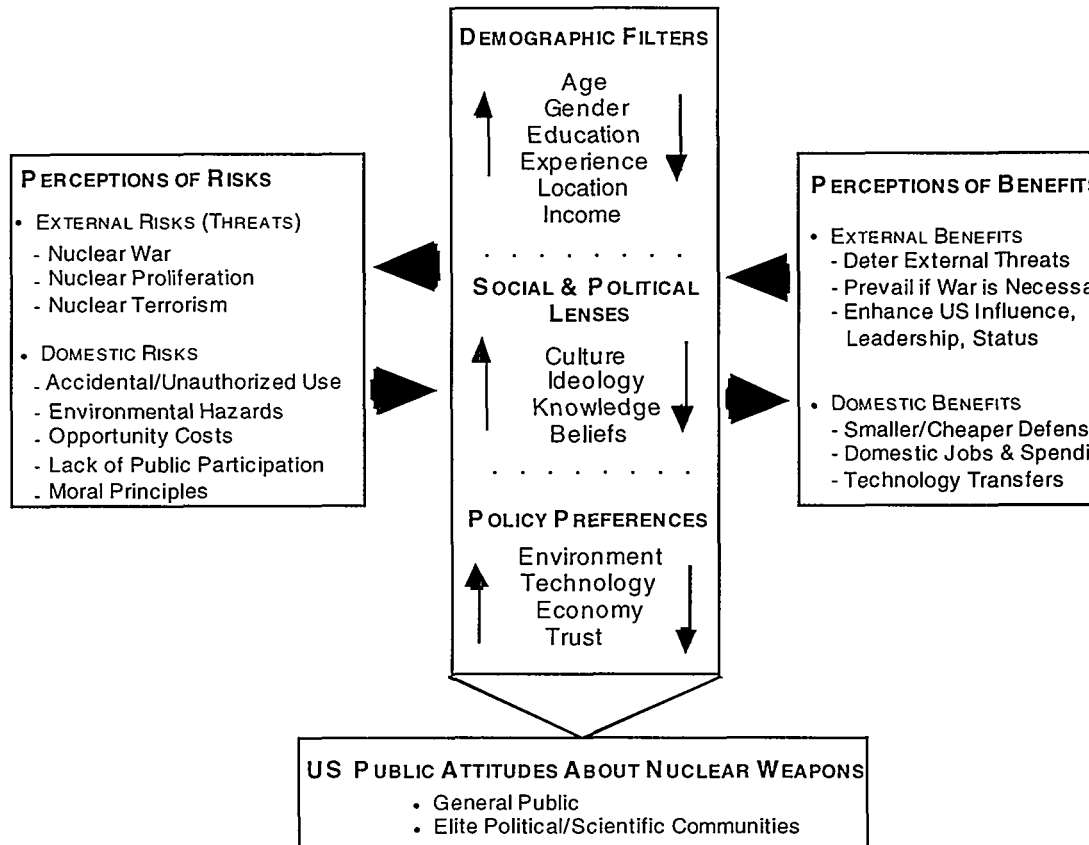
To help refine lines of inquiry for our interviews with policy elites, we conducted a focus group discussion among security policy analysts in Washington, DC. Our analysis of this focus group is provided in Volume II: Appendix 2.

Section 1.3: Analytic Model

THROUGHOUT THIS SERIES OF STUDIES, WE HAVE BEEN GUIDED BY AN analytic framework within which we hypothesized key relationships expected to be influential in shaping opinions and preferences about nuclear security among members of the general public and among elites. From this framework, we initially drafted base line questions designed to measure key perceptions of risks and benefits associated with nuclear weapons and to examine their interaction with demographic filters, social and political lenses, and policy preferences. Questions about nuclear security were specifically designed to illuminate relationships among these sets

of variables and to provide a core of continuity among all four phases of our project. We have hypothesized, and research results indicate, that some key variables may be related as shown in Figure 1.1.

Figure 1.1: Analytic Model



The analytic framework has important implications for the role of public opinion in security policy processes, because it hypothesizes that public attitudes about nuclear security policy result from a coherent (though informal) evaluation of risks and benefits perceived to be associated with nuclear weapons, and the relationships of those risks and benefits to associated policy preferences. The framework suggests that the evaluation of nuclear risks and benefits occurs within the context of a number of factors specific to each individual. Among them are the following sets of variables:

- Demographic factors such as age, gender, education, income, training, experience, and place of residence.
- Social and political lenses shaped by political culture and ideology, subject knowledge, and belief systems.
- Preferences about related public policy issues such as the environment, the role of technology in society, economic considerations, and trust in public institutions and processes.

Because our analytic framework does not postulate that basic policy evaluation processes differ conceptually among different publics, we hypothesize that members of the general public not having technical training or policy making expertise reach judgments about nuclear security issues in much the same fashion as do members of elite groups, though results may significantly differ. Comparing the ways in which various publics relate risk and benefit perceptions to preferences about security policy options has been among our key objectives throughout this project. If repeated findings over time are consistent with underlying assumptions about our analytic framework, consistent evidence would support greater involvement and participation by various publics in evolving nuclear security policies.

Section 1.4: Research Design

THIS PHASE OF OUR PROJECT CLOSELY INTEGRATES BOTH QUANTITATIVE and qualitative research methods. In Volume I we report the largely quantitative analysis of a nationwide telephone survey of 1,483 members of the general public selected at random from US households having telephones. The survey was conducted from 13 September to 14 October 1999. Sampling and data collection methods are discussed in Volume I: Appendix 1.

The survey included a core set of questions we used in previous surveys of the general public in 1993, 1995, and 1997 that supports trend analysis of key perceptions and preferences. We also asked new questions relating to preferences about (a) retaliating to attacks against the US, its troops or allies in which weapons of mass destruction are used, (b) the relationship of precision guided munitions to nuclear weapons, and (c) national missile defenses. Additionally, we introduced a new approach to measuring respon-

dents' worldviews and beliefs about the security environment, and we used the results to help investigate relationships between policy beliefs and security perceptions and policy preferences.

In Volume II we report the largely qualitative analysis of in-depth interviews we conducted with fifty members of the US security policy community. Each interview was approximately one and one-half to two hours in length, and each followed a topical outline provided to the interview participant prior to the discussions. All interviews were recorded on audiotapes from which we prepared verbatim written transcripts. Each interview subject was afforded an opportunity to review and edit the transcript of his or her interview. Then we entered finalized transcripts into specialized software for qualitative analysis, and each paragraph was coded by two researchers using different coding schemes to enhance validity. We sorted respondents' remarks relating to each of the interview topics according to the two separate coding schemes. Then we synthesized results and reported them in Volume II. We provide interview protocols and discuss coding methods and qualitative analysis techniques in Volume II: Appendix 1.

N-dimensional cluster analysis techniques were employed with the general public data to group participants into clusters sharing similar perspectives of the external and domestic risks and benefits associated with nuclear weapons. A similar clustering technique was applied to five dimensions of views among the fifty policy experts we interviewed. Results yielded associational groupings of participants exhibiting intragroup commonalities and intergroup relationships that afforded a bridge between nuclear security views of the general public and those of policy elites.

Section 1.5: Organization of Volume I

IN CHAPTER TWO, "TRENDS IN RISK AND BENEFIT PERCEPTIONS," WE report evolving views of the post-Cold War security environment. Then we create composite measures of external and domestic nuclear weapons risk perceptions and external and domestic nuclear weapons benefit perceptions. We compare means for the same measures among general public respondents in 1993, 1995, 1997, and 1999 to show trends in public views of the risks and benefits associated with nuclear weapons.

Chapter Three, “Trends in Policy and Spending Preferences,” compares trends in mean preferences for selected security policy and spending issues over the three two-year measurement intervals. We include views about nuclear force structure and posture, the viability of nuclear deterrence, and directional preferences for investments in selected nuclear weapons infrastructure categories. Then composite nuclear risk and benefit indices are used to predict security policy preferences.

In Chapter Four, “Emerging Issues,” we report public views in 1999 about precision guided munitions, response options for attacks against the US, its troops, or allies in which weapons of mass destruction are used, and issues related to strategic missile defenses.

Chapter Five, “Belief Systems and Nuclear Security,” reports measures of political party affinity and political ideology. Also we construct a composite index based on preferences for nine pairs of contrasting statements about security policy beliefs. Then using multiple regression techniques, we relate policy beliefs to perceptions of the risks and benefits of nuclear weapons (bidirectionally) and to preferences for security policy and spending options.

In Chapter Six, “Demographics and Nuclear Security,” we explore the relationship of age, gender, and socioeconomic status to perceptions and preferences about nuclear security.

In Chapter Seven, “Mapping Public Views About Nuclear Security,” we employ causal modeling to examine key areas of our analytic model and to explain why groups of citizens who share core beliefs and policy beliefs and perceptions of nuclear risks and benefits can be expected to share similar preferences about nuclear security policy options. Then we employ cluster analysis to identify coherent groups of respondents who share views about nuclear security, and we use group membership to predict policy and spending preferences. We conclude with observations about the coherence of public views about nuclear security.

Appendix 1 provides an explanation of our sampling methodology and compares key demographic characteristics of our respondents to those of the population at large. We also describe data collection methods and procedures, and report our response rate.

In Appendix 2 we provide an in-depth qualitative analysis of the three focus groups conducted with members of local publics in Boston, Dallas, and Portland.

Appendix 3 compares frequency distributions of responses and their means for each of the eight surveys conducted thus far in this project.

Volume I: Chapter Two

Trends in Risk and Benefit Perceptions

THIS CHAPTER COMPARES TRENDS IN PUBLIC VIEWS ABOUT THE international security environment and perceptions of risks and benefits associated with nuclear weapons. First we compare perceptions of respondents in 1997 and 1999 about how the national and international security environments have changed since the end of the Cold War. We then compare views from the same two groups about the threat posed to the US by nuclear weapons in Russia and China reported in 1997 and 1999 and for the coming decade. Next we compare trends in broader perceptions of external nuclear weapons risks from 1993 to 1999, and then we make similar comparisons in trends about domestic nuclear weapons risk perceptions. Finally, we compare trends in public perceptions of the external and domestic benefits associated with US nuclear weapons.

Section 2.1: Trends in Perceptions of the Security Environment and External Nuclear Risks

General Impressions of the Security Environment

BEGINNING IN 1997 AND CONTINUED IN 1999, WE ASKED RESPONDENTS to rate how international security has changed since the end of the Cold War. Also we asked them to evaluate how US security has changed during the same period. For both measures, responses were expressed on a scale where one meant “much less secure,” and seven meant “much more secure.” Grouped responses and means are compared in Tables 2.1 and 2.2.¹ Note that a small but statistically significant decrease in mean perceptions of international security was observed from 1997 to 1999, but that the small decrease in mean perceived *US* security over the same two

¹ Question wordings and distributions of responses are in Volume I: Appendix 3, Q1–2.

years was not significant.² Distributions of answers across the full response scales approximated a normal curve, and means for both measures were near midscale. Though the grouped distributions reflected a tendency for respondents to consider today's environment to be more secure than that of the Cold War, the differences were not large. This suggests that members of the public considered today's security environment to be marginally improved over that of the Cold War, but that margin may be decreasing. As to *US* security, respondents considered national security to be marginally improved over the Cold War, and public perceptions in 1999 did not differ significantly from those reported in 1997.

Table 2.1: How International Security Has Changed Since the End of the Cold War³

Group (Q1)	Less Secure %	Unchanged %	More Secure %	Means (1-7)	p-Value
Public 99	33	21	45	4.1	.0057
Public 97	29	19	53	4.3	

Table 2.2: How US Security Has Changed Since the End of the Cold War⁴

Group (Q2)	Less Secure %	Unchanged %	More Secure %	Means (1-7)	p-Value
Public 99	32	18	50	4.3	.3805
Public 97	30	19	52	4.4	

² Throughout this study, we report the results of analyses of variance (ANOVAs) in terms of p-value, which is a measure of the probability that differences in means between groups would have occurred by chance. In this report, statistical significance is attributed to those differences that would have occurred by chance fewer than five times in 100 (equivalent to a 95 percent confidence level). However, statistical significance does not always equate to operational relevance. The relevance of statistically significant differences in means must be judged in the context of the variables being measured and the groups being compared. In table 2.1, the difference in means between general public respondents in 1997 and 1999 would have occurred by chance only 57 times in 10,000 occurrences, and is therefore considered statistically significant. In Table 2.2, the difference in means would have occurred by chance 3,805 times in 10,000 occurrences, and is not considered statistically significant.

³ Question wording and distribution of responses is shown in Volume I: Appendix 3, Q1.

⁴ Question wording and distribution of responses is shown in Volume I: Appendix 3, Q2

Perceptions of Strategic Nuclear Threats

To judge how public views about threats posed to the US by Russian and Chinese nuclear forces are changing, we asked respondents in 1997 and 1999 to rate the current nuclear threat and the future (next ten years) nuclear threat to the US from Russia and China. Answers were provided on a scale where zero meant “no threat,” and ten meant “extreme threat.” Mean ratings are compared in Table 2.3.⁵

Table 2.3: Current and Future Threat to the US from Russian and Chinese Nuclear Weapons

Threat Source and Period	Means (Q47–50: Scale 0–10)		p-Value
	Public 1997	Public 1999	
Russia now	4.8	5.1	.0002
China now	5.8	6.3	<.0001
Russia in 10 years	4.7	5.1	<.0001
China in 10 years	5.8	6.5	<.0001

Note that mean public judgments of current and future threats to the US posed by Russia’s and China’s nuclear forces both increased significantly from 1997 to 1999. Also note that in 1997 and 1999 current and future nuclear threats from China were judged substantially higher, on average, than those from Russia. These results imply that the US public considers China to have replaced Russia (and the former Soviet Union) as the greater nuclear threat to US interests. Also, China’s nuclear weapons were expected to pose an increasing future threat, while the projected threat from Russia’s nuclear weapons was stable.

⁵ Question wording and distributions of responses to each question are shown in Volume I: Appendix 3, Q47–50.

Composite Indications of External Nuclear Risk Perceptions

To provide other measures of public perceptions about nuclear security in today's environment, we asked the following six questions.⁶

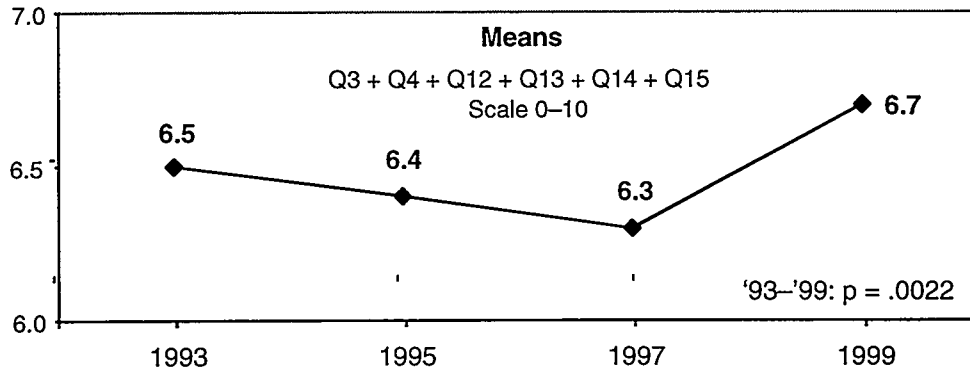
- How has the breakup of the Soviet Union affected the chances that the *US* will be involved in a war with *any* country in which nuclear weapons are used? (Q3: 1 = Decreased Greatly—7 = Increased Greatly)
- How do you think the breakup of the Soviet Union has affected the possibility that nuclear weapons will be used by *any* country against *any* other country? (Q4: 1 = Decreased Greatly—7 = Increased Greatly)
- How do you think the breakup of the Soviet Union has affected the likelihood that nuclear weapons will spread to other countries? (Q12: 0 = Greatly Reduced—10 = Greatly Increased)
- How would you rate the risk to the US if more countries have nuclear weapons? (Q13: 0 = No Risk—10 = Extreme Risk)
- How would you rate *today's* threat of nuclear terrorism occurring anywhere in the world? (Q14: 0 = No Threat—10 = Extreme Threat)
- How would you rate the threat of nuclear weapons being used by terrorists anywhere in the world during the *next ten years*? (Q15: 0 = No Threat—10 = Extreme Threat)

Responses to these six questions were combined to form a robust indicator that we term the external nuclear risk index.⁷ Changes in the mean value of this index since 1993 are compared in Figure 2.1.

⁶ Question wording and distributions of responses to each question are shown in Volume I: Appendix 3, Q3–4 and Q12–15.

⁷ The 1–7 scale used for responses to questions 3 and 4 was converted to a 0–10 scale before being combined with responses to the other questions. Values from each of the six questions were then averaged, ignoring missing values, to form the external nuclear risk index.

Figure 2.1: Trends in the Mean External Nuclear Risk Index: 1993–1999
(Scale Midpoint = 5.0)



Note that mean composite perceptions of external risks from others' nuclear weapons declined slightly from 1993 to 1997, but turned upward in 1999. The difference in means between 1997 and 1999 is highly statistically significant ($p < .0001$), and the overall difference in means between 1993 and 1999 also is statistically significant ($p = .0022$). In combination with the perceptions of risks stemming from Russian and Chinese nuclear capabilities reported in Table 2.2, these findings imply that public perceptions of the risks to the US posed by other countries' nuclear forces reversed a slow decline in 1999, and were significantly higher than they were when we began in 1993.

Section 2.2: Trends in Perceptions of Domestic Nuclear Risks

ANOTHER DIMENSION OF NUCLEAR RISK PERCEPTIONS CONSISTS OF views about risks associated with developing and maintaining the US nuclear arsenal. In 1993, 1995, 1997, and 1999, we asked members of the general public to rate their perceptions of the risks associated with five key tasks involved in managing US nuclear weapons: manufacturing, transporting, storing, disassembling nuclear weapons in the US, and storing radioactive materials in the US from disassembled weapons. Additionally, we asked respondents to rate the likelihood of a US nuclear weapon being used without presidential authorization and the likelihood of

an accident involving a US nuclear weapon causing an unintended nuclear explosion. Following are the seven questions:⁸

Lead-in: The next several questions ask for your perceptions about risks to American society associated with managing US nuclear weapons. Using a scale from zero to ten where zero means *no risk*, and ten means *extreme risk*, how would you rate the risk of each of the following items:

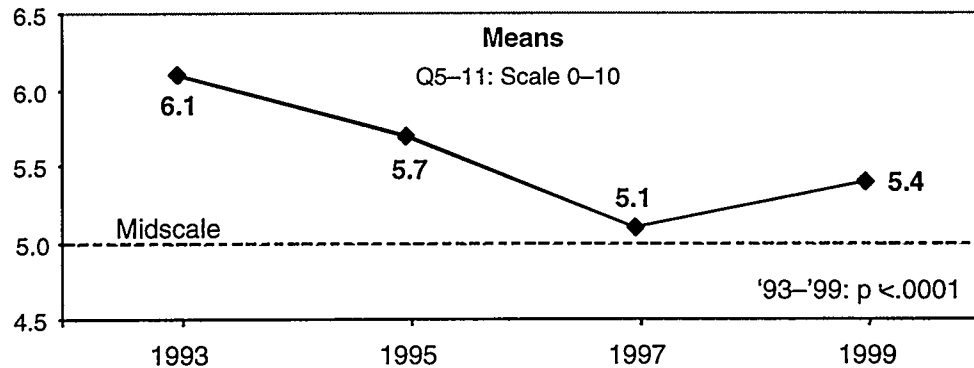
- Manufacturing nuclear weapons in the US? (Q5)
- Transporting nuclear weapons in the US? (Q6)
- Storing existing nuclear weapons in the US? (Q7)
- Disassembling nuclear weapons in the US? (Q8)
- Storing radioactive materials in the US from disassembled weapons? (Q9)
- Some people worry that a nuclear weapon might someday be used by US forces without the president's authorization. How would you rate the likelihood of a US nuclear weapon being used within the next 25 years without presidential authorization? (Q10: 0 = Not At All Likely—10 = Highly Likely)
- Some people are concerned about the possibility of an accidental explosion of a nuclear weapon. How would you rate the likelihood of an accident involving a US nuclear weapon causing an unintended nuclear explosion? (Q11: 0 = Not At All Likely—10 = Highly Likely)

We combined responses to these seven questions to form a robust indicator that we term the domestic nuclear risk index.⁹ In Figure 2.2 we compare trends in the mean value of this index measured between 1993 and 1999.

⁸ Question wording and distributions of responses to each question are in Volume I: Appendix 3, Q5–11.

⁹ Responses to each of the six questions were averaged, ignoring missing values, to form the domestic nuclear risk index.

Figure 2.2: Trends in the Mean Domestic Nuclear Risk Index: 1993–1999
(Scale Midpoint = 5.0)



Our composite measure of domestic nuclear risks averaged higher in 1993 than in any subsequent year. After dropping substantially in 1995 and 1997, our mean index increased significantly from 5.1 to 5.4 in 1999 ($p = .0011$). However, the 1999 value is still significantly lower than our initial measure in 1993 ($p < .0001$). So while public perceptions of risks stemming from our own nuclear arsenal remained lower than they were shortly after the end of the Cold War, they increased during the most recent two year period. Our risk perception data suggest that public sensitivities to both external and domestic nuclear weapons risks may be increasing.

Section 2.3: Trends in Perceptions of External Nuclear Benefits

EXTERNAL NUCLEAR WEAPONS BENEFITS REFER TO ENHANCEMENTS TO US security and influence perceived to derive from US nuclear weapons. We measured perceptions of benefits from the US nuclear arsenal in several related categories: enhancements to US international influence and status; importance of the US remaining a military superpower; importance of US nuclear weapons to preserving the American way of life; importance of nuclear deterrence during both the Cold War and today; and expectations about nuclear deterrence in the future. We combined responses to seven questions to form our external nuclear weapons benefit index. The first six were answered on a scale where zero meant “not at all important,” and

ten meant “extremely important.” The last question used a scale where one meant “not at all effective,” and ten meant “extremely effective.”¹⁰

- How important are US nuclear weapons for US influence over international events? (Q16)
- How important are US nuclear weapons for maintaining US status as a world leader? (Q17)
- How important is it for the US to remain a military superpower? (Q18)
- How important have nuclear weapons been to preserving America’s way of life? (Q19)

Lead-in: The next three questions ask about your perceptions of nuclear deterrence, which means preventing someone from using nuclear weapons against us, because they expect that we would retaliate by using nuclear weapons against them.

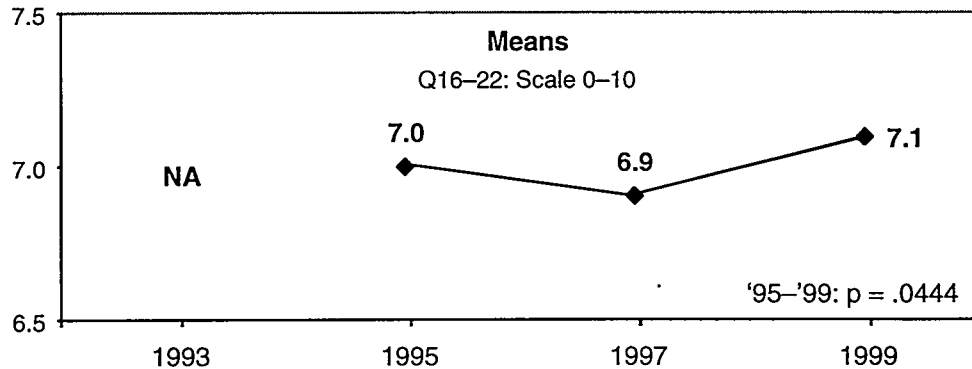
- First, how important was nuclear deterrence in preventing nuclear conflict during the Cold War? (Q20)
- How important are US nuclear weapons for preventing other countries from using nuclear weapons against us today? (Q21)
- If more countries acquire nuclear weapons in the future, how effective will nuclear deterrence be in preventing nuclear wars from occurring anywhere in the world? (Q22)

When combined, responses to these seven questions form a robust indicator that we term the external nuclear benefit index.¹¹ The three nuclear deterrence questions were not added until 1995, so a comparative mean index for 1993 is not available. We show trends in the mean value of this index since 1995 in Figure 2.3.

¹⁰ Question wording and distributions of responses to each question are in Volume I: Appendix 3, Q16–22.

¹¹ Responses to each of the seven questions were averaged, ignoring missing values, to form the external nuclear benefit index.

Figure 2.3: Trends in the Mean External Nuclear Benefit Index: 1995–1999
(Scale Midpoint = 5.0)



Though absolute differences in means are relatively small, the increase in perceived benefits in 1999 compared to 1997 is statistically significant ($p = .0025$), and the difference in means between 1995 and 1999 also is within the significant range ($p = .0444$).

The fact that public perceptions of benefits from US nuclear weapons apparently are *not* declining is noteworthy. We hypothesized that perceptions of the importance of nuclear weapons for US influence and status and the relative value of nuclear deterrence would decrease after the Cold War. Thus far, however, our data do not support the expected decline in valuation of US nuclear weapons among members of the general public.

Section 2.4: Trends in Perceptions of Domestic Benefits

MEASURING PUBLIC PERCEPTIONS OF *DOMESTIC* BENEFITS OF US nuclear weapons is more difficult than gauging perceptions about external nuclear weapons benefits. Detailed assessment of potential domestic benefits associated with US nuclear weapons requires differentiating nuclear from non-nuclear investments, which is a complex task. One reason is that many US weapon systems have the capability to employ both nuclear and non-nuclear munitions. Some primarily conventional forces, such as attack aircraft, tanks, artillery, and ships, also may have the capabilities to employ nuclear munitions. Other systems that were designed primarily as strategic delivery vehicles, such as the B-52 and B-1 bomber aircraft, may later be adapted to primarily conventional roles.

Second, expenditures for personnel and support equipment are not easily separated into nuclear and non-nuclear categories. Many of the requisite technical skills and experiences are applicable to both nuclear and non-nuclear operations.

Third, research and development investments for many systems span both nuclear and conventional applications. Many weapon systems are designed to have both nuclear and non-nuclear capabilities, and the ultimate use of those systems sometimes is not determined until operationally fielded.

Fourth, some portions of investments for highly sensitive strategic intelligence and other operational capabilities associated with nuclear weapons capabilities are reported under funding categories that are sufficiently sensitive as to require protection from public disclosure.

Finally, substantial investments in nuclear weapons capabilities are made outside the defense budget. For example, Department of Energy investments in nuclear weapons development and stockpile stewardship are directly related to US nuclear weapons capabilities, but they are not in the same categories as Department of Defense direct expenditures on operational nuclear forces.

Because of these and other complexities, those portions of US expenditures associated with nuclear weapons capabilities are very difficult to separate from those portions of the budget associated with purely non-nuclear capabilities. Given these considerations, we asked our respondents about their perceptions regarding the following three broad dimensions of domestic benefits related to defense expenditures.¹²

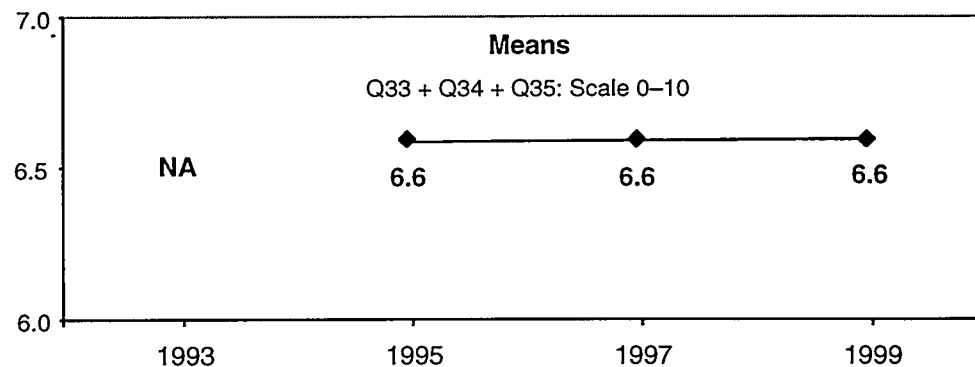
- Please respond to the following statement. Having a nuclear arsenal means the US can spend less for national defense than would be necessary without nuclear weapons. (Q33: 1 = Strongly Disagree—7 = Strongly Agree)
- How do you rate the economic value of defense industry jobs in America? (Q34: 1 = Little Economic Value—7 = Great Economic Value)

¹² Question wording and distributions of responses to each question are in Volume I: Appendix 3, Q33–35.

- How do you rate the economic value of technological advances in defense industries for other areas of the US economy? (Q35: 1 = Little Economic Value—7 = Great Economic Value)

Combined responses to these three questions provide a general indication of benefit perceptions that we term the domestic nuclear benefit index.¹³ The question about the value of technological advances in defense industries was not asked of the general public in 1993, so comparative mean indices are available only for subsequent surveys. As shown in Figure 2.4, the trend in mean values for this index is flat.

Figure 2.4: Trends in the Mean Domestic Nuclear Benefit Index: 1995–1999 (Scale Midpoint = 5.0)



Section 2.5: Summarizing Perceptions of the Security Environment and Nuclear Risks and Benefits

Security Environment

OUR DATA INDICATE THAT IN 1999 THE GENERAL PUBLIC CONSIDERED the international security environment and overall US national security to have improved only marginally since the end of the Cold

¹³ Responses from each of the three questions were converted to a zero to ten scale and averaged, ignoring missing values, to form the domestic nuclear benefit index.

War. Assessments of international security were significantly lower in 1999 than those reported in 1997, but perceptions of US national security did not change significantly in the same two-year period.

In the views of our respondents, Russia has been replaced by China as the chief nuclear threat to the US, and participants considered the nuclear threat from both sources in 1999 to be significantly greater than that reported in 1997. When asked to project the nuclear threat to the US from each country over the next decade, China was expected to pose an increasing threat, while Russia was not.

Nuclear Weapons Risk and Benefit Perceptions

External Nuclear Weapons Risks

After slowly declining from 1993 to 1997, our composite index of six individual measures of the risks to the US from others' nuclear weapons increased significantly in 1999. The increase also was large enough to be statistically significantly above the same 1993 measure. Respondents in 1999 considered external nuclear weapons risks to have reversed their downward trend, and component risk measurements combined to form the highest external nuclear risk index since we began this project. Our data do not explain *why* perceptions of external nuclear risks increased, but information from focus group discussions implies that nuclear testing by India and Pakistan and US government efforts to increase preparedness to respond to potential terrorism in which mass casualty weapons are used may be contributing factors.

Domestic Nuclear Weapons Risks

Public perceptions of the risks deriving from our own nuclear arsenal, as measured by our composite risk index of seven individual measures of the risks of living with nuclear weapons, also were higher in 1999, after declining substantially from their high in 1993. The 1999 increase in domestic risk perceptions was significantly higher than the 1997 measure, but still was significantly below the same measures in 1993 and 1995. Again, we

have insufficient information to assess causality, but we note that past perceptions of domestic nuclear risks seem to be directionally associated with changes in perceptions of external nuclear risks.

External Nuclear Weapons Benefits

Using an expanded composite index begun in 1995 and composed of seven separate measures of benefits associated with US nuclear weapons, public views were significantly higher in 1999 than in either 1997 or 1995. This is counter to our expectations about a hypothesized decline in public perceptions of the benefits from the US nuclear arsenal after the Cold War.

Domestic Nuclear Weapons Benefits

Using a less robust index of three indications of perceived domestic benefits from US nuclear weapons and military investments, we recorded a steady value of 6.6 (on a scale where zero meant “not at all beneficial,” and ten meant “extremely beneficial” in 1995, 1997, and 1999. Again, we expected to see a decline in these kinds of valuations when we began the project in 1993.

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Volume I: Chapter Three

Trends in Policy and Spending Preferences

IN THIS CHAPTER, WE EXAMINE TRENDS IN GENERAL PUBLIC VIEWS ABOUT selected security policy options and spending preferences. First we compare views about whether US nuclear forces should be retained. Then we examine perspectives about the size of the US nuclear arsenal. Next we analyze trends in public preferences about strategic investment levels. Finally, we relate perceptions of nuclear weapons risks and benefits to policy issues.

Section 3.1: Viability of Nuclear Weapons

THE END OF THE COLD WAR STIMULATED ONGOING DEBATE ABOUT THE future of nuclear weapons. Some analysts have suggested that the new security environment provides an unprecedented opportunity to reverse the excesses of the nuclear arms race and to move toward deep reductions in nuclear armaments and de-alerting of nuclear forces. These and other efforts to de-emphasize the role of nuclear weapons in security planning are thought by some to be prerequisite steps that can lead toward eventual elimination of all nuclear armaments worldwide.¹

The literature on these subjects is rich, the issues are complex, and the debate is for very high stakes. Opposing positions involve deeply held beliefs about the nature of security, the preferred international role of the US, the potential for the employment of nuclear weapons and other weapons of mass destruction, and the purposes for which nuclear armaments can or cannot be justified. In Volume II, we explore the views of fifty security policy experts about these and related issues.

¹ The body of relevant literature is much too large to cite comprehensively, but for cogent arguments for reducing to lower levels of nuclear weapons see (among others): Butler, 1999; Feiveson, 1999; Carter and Perry, 1999; Schneider and Dowdy, eds., 1998; Mazarr, 1997; Committee on International Security and Arms Control, 1997; Allison, et al, 1993; Bundy, Crowe, and Drell, 1993; and Flournoy, 1993. For international perspectives on eliminating nuclear weapons see (among others): Stares, ed., 1998; Canberra Commission, 1996; and Rotblat, Steinberger, and Udgaonkar, eds., 1993.

To help gauge how views about nuclear weapons are evolving among the US general public, we have included questions throughout this project designed to chart trends in perceptions about the viability of nuclear weapons. In each of our studies, we asked participants to respond to the following two statements about the feasibility of eliminating nuclear weapons using a scale where one meant “strongly disagree,” and seven meant “strongly agree.”²

- It is feasible to eliminate all nuclear weapons worldwide within the next 25 years. (Q30)
- Even if all the nuclear weapons could somehow be eliminated worldwide, it would be extremely difficult to keep other countries from building them again. (Q31)

Grouped responses and mean values are summarized in Tables 3.1 and 3.2.

Table 3.1: Feasible to Eliminate All Nuclear Weapons in Next 25 Years

Group (Q30)	Disagree % (1–3)	Unsure % (4)	Agree % (5–7)	Means (1–7)	p-Value
Public 99	52	8	40	3.6	‘99–’97:
Public 97	51	6	42	3.8	.2242
Public 95	45	9	45	4.0	‘99–’93:
Public 93	51	6	43	3.8	.1446

Table 3.2: Extremely Difficult to Prevent Others from Rebuilding

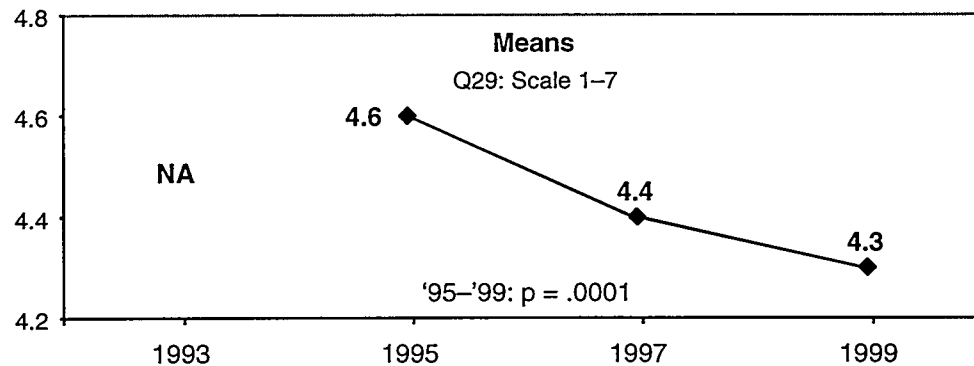
Group (Q31)	Disagree % (1–3)	Unsure % (4)	Agree % (4–7)	Means (1–7)	p-Value
Public 99	12	3	84	5.9	‘99–’97:
Public 97	14	4	83	5.8	.0275
Public 95	10	6	83	5.8	‘99–’93:
Public 93	11	4	84	5.9	.4292

² Question wording and distributions of responses are in Volume I: Appendix 3, Q30–31.

Responses to both questions largely have been stable since 1993, with one minor change in 1995 when the public seemed evenly split over the question of the feasibility of eliminating nuclear weapons. Otherwise, a small majority of respondents have doubted the feasibility of nuclear abolition, and large majorities consistently have agreed that if all nuclear weapons were somehow eliminated, it would be very difficult to prevent others from rebuilding them. Public sentiment about these two assertions has varied little during our project.

In the context of arms control agreements, we asked respondents beginning in 1995 to express how they felt about the US agreeing to a provision that requires eventually eliminating all of its nuclear weapons. No reference was made to Article VI of the NPT.³ Responses were provided on a scale where one meant “strongly oppose,” and seven meant “strongly support.”⁴ The trend in mean responses since 1995 is shown in Figure 3.1.

Figure 3.1: Support for Agreement to Eliminate All Nuclear Weapons
(Scale Midpoint = 4.0)



Note that mean responses declined in both 1997 and 1999. The difference in means between 1995 and 1999 is statistically significant ($p = .0001$), indicating an apparent decrease in support for such an agreement.

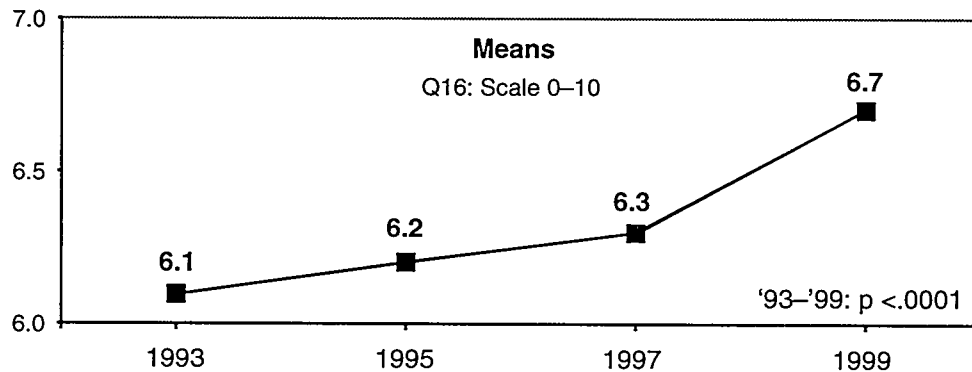
³ Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons reads as follows: “Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.”

⁴ Question wording and distribution of responses are in Volume I: Appendix 3, Q29.

When the subject is shifted from the prospects for nuclear abolition to public valuations of US nuclear weapons, multiple measurements all indicate a clear upward trend. Figures 3.2–3.6 show trends in mean public responses to the following five questions about the importance of US nuclear weapons. Each was answered on a scale where zero meant “not at all important,” and ten meant “extremely important” (note that vertical scales vary.)⁵

- How important are US nuclear weapons for US influence over international events? (Q16)
- How important are US nuclear weapons for maintaining US status as a world leader? (Q17)
- How important is it for the US to remain a military superpower? (Q18)
- How important have nuclear weapons been for preserving America’s way of life? (Q19)
- How important is it for the US to retain nuclear weapons today? (Q32)

Figure 3.2: Trends in Mean Importance of Nuclear Weapons for US Influence (Scale Midpoint: 5.0)



⁵ Question wording and distributions of responses for each question are in Volume I: Appendix 3, Q16–19, Q32. Questions 16–19 were included in our nuclear weapons benefit index described in Chapter Two.

Figure 3.3: Trends in Mean Importance of Nuclear Weapons for US Status
(Scale Midpoint = 5.0)

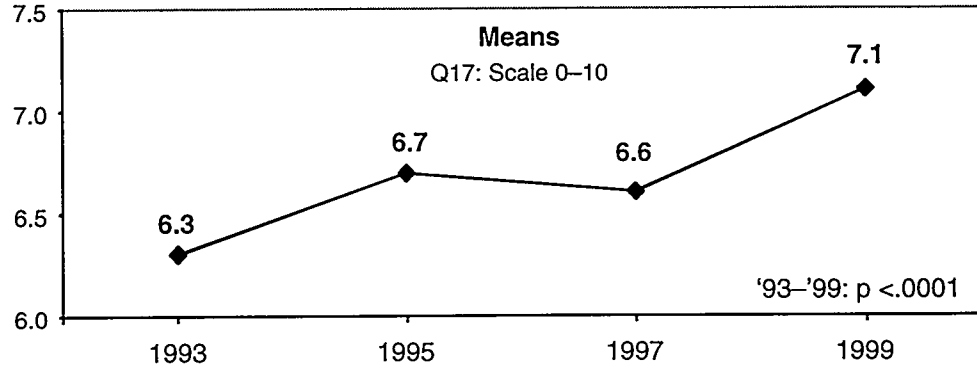


Figure 3.4: Trends in Mean Importance of Remaining a Military Superpower
(Scale Midpoint = 5.0)

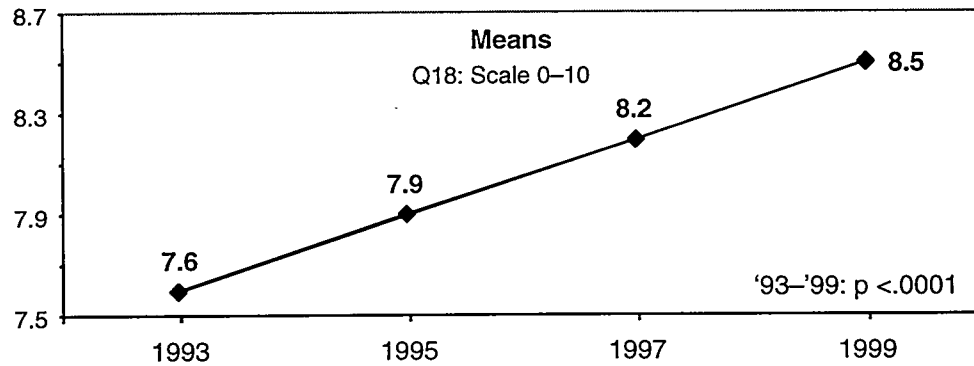


Figure 3.5: Trends in Mean Importance of Nuclear Weapons for Preserving America's Way of Life
(Scale Midpoint = 5.0)

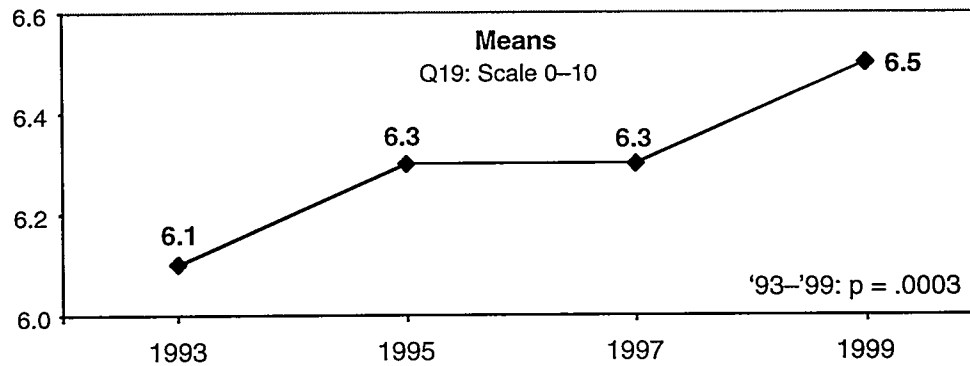
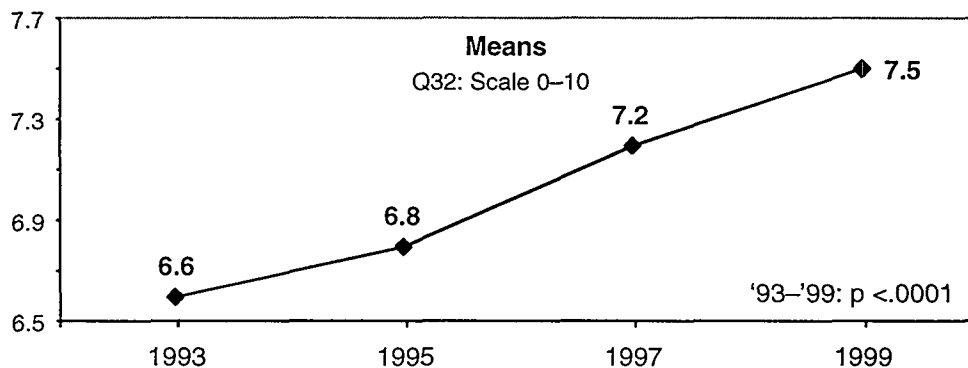


Figure 3.6: Trends in Mean Importance of Retaining US Nuclear Weapons
(Scale Midpoint = 5.0)



In each of the above patterns of responses, the trend toward higher valuation of US nuclear weapons is unmistakable. For *each* question, the increase in importance assigned in 1999 compared to that reported in 1993 was statistically significant. Rather than an expected devaluation of nuclear weapons following the Cold War, members of the general public have *increased* the levels of importance they attach to US nuclear weapons capabilities.

Section 3.2: Efficacy of Nuclear Deterrence

NUCLEAR DETERRENCE IS A CENTRAL CONCEPT HIGHLY RELEVANT TO the future of nuclear security. Few subjects are likely to figure more prominently in debates about how US nuclear policy should evolve. In Volume II, we discuss the views of the security policy experts we interviewed about the efficacy of deterrence. Here we summarize data from four inquiries about nuclear deterrence that were posed to members of the general public.

First, to measure perceived importance of nuclear deterrence in the past, beginning in 1995 we asked respondents how important nuclear deterrence had been in preventing nuclear conflict during the Cold War.⁶ Responses were provided on a scale where zero meant “not at all important,” and ten meant “extremely important.” Mean ratings were 7.8 in 1995, 7.6 in 1997, and 7.7 in 1999. Changes were not statistically significant.

⁶ Question wording and distributions of responses are in Volume I: Appendix 3, Q20.

To measure current valuations of nuclear deterrence on the same zero to ten scale, we asked respondents to rate the importance of nuclear deterrence for preventing other countries from using nuclear weapons against the US today.⁷ Mean values were 7.6 in 1995, 7.4 in 1997, and 7.7 in 1999. Here too, differences in means were not statistically significant.

To examine a somewhat different dimension of the relevance of nuclear deterrence, we changed the context in three important ways. First, we shifted the time period to the future. Second, we told respondents to assume further nuclear proliferation. And third, we changed the measure of merit from “importance” to “effectiveness.” All three changes were designed to present a more difficult case for nuclear deterrence. The question was as follows: If more countries acquire nuclear weapons in the future, how effective will nuclear deterrence be in preventing nuclear wars from occurring anywhere in the world?⁸ Responses were provided on a scale where zero meant “not at all effective,” and ten meant “extremely effective.” Mean ratings were 6.0 in 1995, 6.0 in 1997, and 5.9 in 1999. Again the slight change was not significant.

In 1999 we added a fourth deterrence question which asked respondents to rate the importance of US nuclear weapons for preventing other countries from using *chemical* or *biological* weapons against the US today.⁹ Responses were given on a scale where zero meant “not at all important,” and ten meant “extremely important.” The mean response was 6.6.

From these response trends we conclude that public valuations of nuclear deterrence have not declined thus far in the post-Cold War era. On average, the past and current importance of nuclear deterrence has consistently been rated well above seven on a scale from zero to ten, and ratings have been largely consistent over the three measurement periods. As expected, when the focus was shifted to the future effectiveness of deterrence for preventing nuclear conflict in a more proliferated world, mean valuations were somewhat lower, but still consistently above midscale. Finally, today’s debate about the efficacy of nuclear deterrence includes the question of whether US nuclear weapons have utility for deterring attacks with other mass casualty

⁷ Question wording and distributions of responses are in Volume I: Appendix 3, Q21.

⁸ Question wording and distributions of responses are in Volume I: Appendix 3, Q22.

⁹ Question wording and distributions of responses are in Volume I: Appendix 3, Q23.

weapons. Respondents in 1999 rated the importance of nuclear deterrence well above midscale for this purpose as well.

These measurements over time indicate that participating publics considered nuclear deterrence to be efficacious, whether the time period was the past, the present, or the foreseeable future, and that they considered US nuclear weapons to have value in deterring attacks involving other weapons of mass destruction.

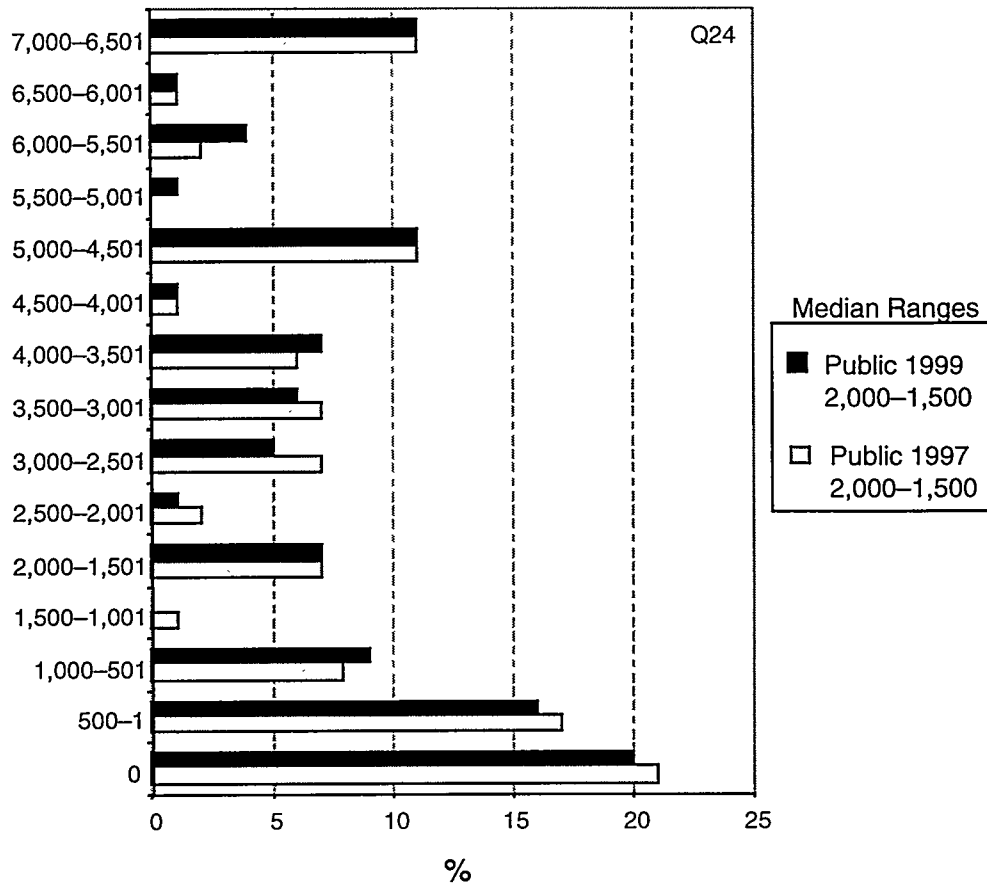
Section 3.3: Sizing the US Nuclear Arsenal

HOW MANY NUCLEAR WEAPONS ARE THOUGHT TO BE NECESSARY? To gauge preferences about the number of US nuclear weapons considered necessary for US security, we asked the following question in 1997 and 1999:

Under the terms of arms reductions agreements, the US and Russia are reducing their stockpiles of nuclear weapons. Recent published reports estimate that the US and Russia each have between 6,000 and 7,000 strategic warheads deployed today. For this question, assume that 7,000 is the maximum number and zero is the minimum. If mutual reductions in the number of US and Russian nuclear weapons can be verified, to approximately what level would you be willing to reduce the number of US nuclear weapons?

The distribution of responses in 1997 and 1999 and associated median ranges are graphed in Figure 3.7.

Figure 3.7: Minimum Numbers of US Nuclear Weapons: 1997 vs. 1999



Three numerical levels of US nuclear weapons are most often considered in contemporary discussions of the future of nuclear security. The START II level of 3,000–3,500 operational strategic weapons is often used as a benchmark. Our data indicate that 44 percent of respondents in 1999 and 49 percent in 1997 considered START II and lower levels (but not zero) to be acceptable. Another benchmark sometimes considered when debating follow-on arms negotiations is approximately 1,000 weapons. Our data show that in the absence of further debate and public deliberation, about one-fourth of respondents in both survey years considered that level or lower (but not zero) to be acceptable. The third level often advocated is complete abolition of all nuclear weapons worldwide. In each of our two survey years, about 20 percent of respondents indicated they would prefer no nuclear weapons.

Other patterns are noteworthy. Notice the consistency with which both national samples of the general public expressed preferences. The median range was 2,000 to 1,500 in both survey years, and there was surprisingly small variation between rating periods in the distribution of respondents who preferred each of the fifteen different response categories. It is also instructive to look at the upper levels. In each of the two years, only about 11 percent preferred no reductions below the current estimated levels of 6,500 to 7,000, and 36 percent of participants in 1999 and in 32 percent in 1997 placed the minimum acceptable number of US nuclear weapons above 3,500.

Section 3.4: Nuclear Investment Preferences

WE HAVE FOUND IN FOCUS GROUP DISCUSSIONS THAT RELATIVELY few members of the general public are conversant in levels of spending associated with US nuclear capabilities. Accordingly, we have not attempted to question respondents about absolute levels of investments. Instead we have asked respondents how they thought current investments for selected purposes should change. We do not assume that most respondents have factual information about various current spending levels (beyond broad impressions), and we are aware that in times of economic prosperity, members of the public are more likely to support increasing funding levels. We have not yet employed contingent valuation methods to estimate the comparative value of changes in nuclear investments or the priority of nuclear investments compared to other areas of spending. Nevertheless, understanding public preferences about the *direction* of future investment levels can be quite valuable when considering investment strategies and objectives, and for recognizing developing trends in public sentiment over time.

To provide directional information about trends, in each of our surveys we asked how respondents thought spending should change for a set of functions directly related to US nuclear weapons capabilities. Together, these indicators provide useful insights about public preferences for investments in nuclear infrastructure, and given ongoing debate about stockpile stewardship in the absence of nuclear testing, our data provide unique insights about how relevant public sentiment is evolving.

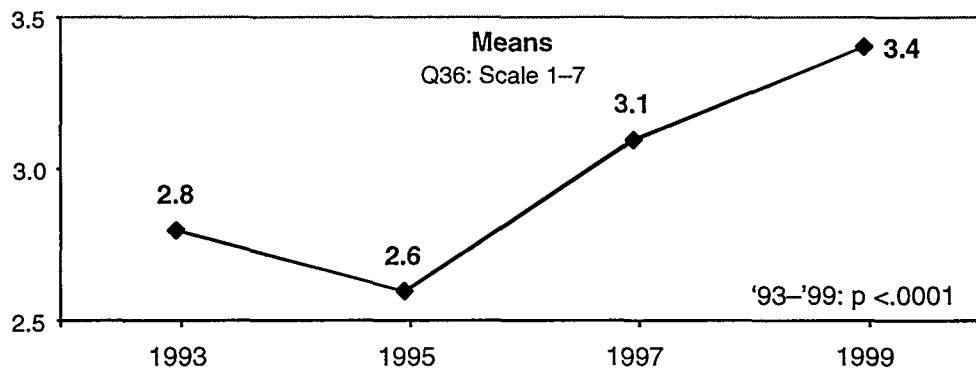
The following five questions have been asked on each survey since we began this project in 1993.¹⁰ Each was answered on a scale where one meant “substantially decrease,” and seven meant “substantially increase.”

How should government spending change for each of the following:

- Developing and testing new nuclear weapons? (Q36)
- Maintaining existing nuclear weapons in reliable condition? (Q37)
- Research to increase the safety of existing nuclear weapons? (Q38)
- Training to insure the competence of those who manage US nuclear weapons? (Q39)
- Maintaining the ability to develop and improve US nuclear weapons in the future? (Q40)

Trends since 1993 in mean responses to each question are compared in Figures 3.8–3.12 (note that vertical scales vary).

Figure 3.8: Spending for Developing and Testing New Nuclear Weapons
(Scale Midpoint = 4.0)



¹⁰ Question wording and distributions of responses are in Volume I: Appendix 3, Q36–40.

Figure 3.9: Spending for Reliably Maintaining Existing Weapons
(Scale Midpoint = 4.0)

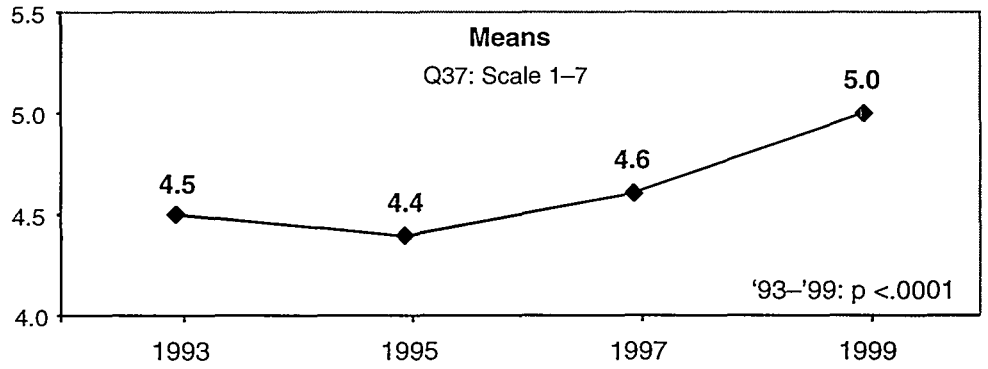


Figure 3.10: Spending for Research to Increase Safety of Existing Weapons
(Scale Midpoint = 4.0)

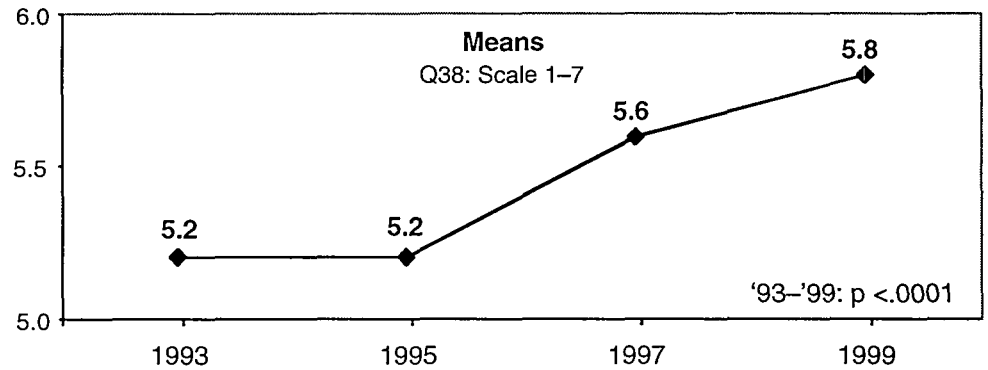


Figure 3.11: Spending for Training for Those Managing Nuclear Weapons
(Scale Midpoint = 4.0)

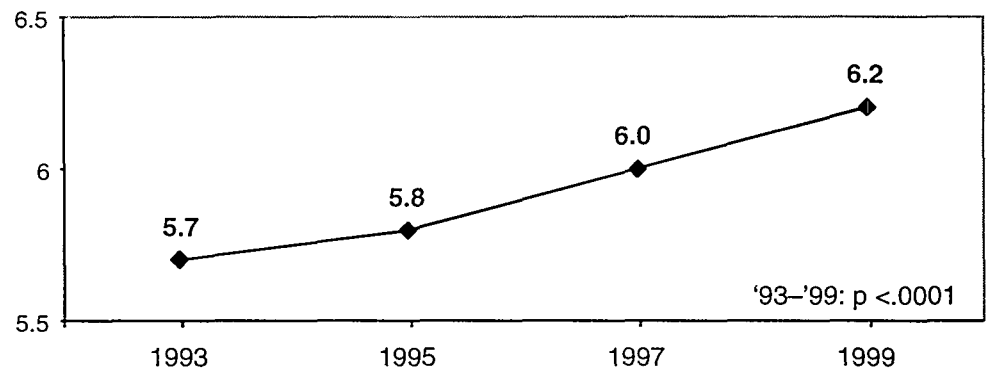
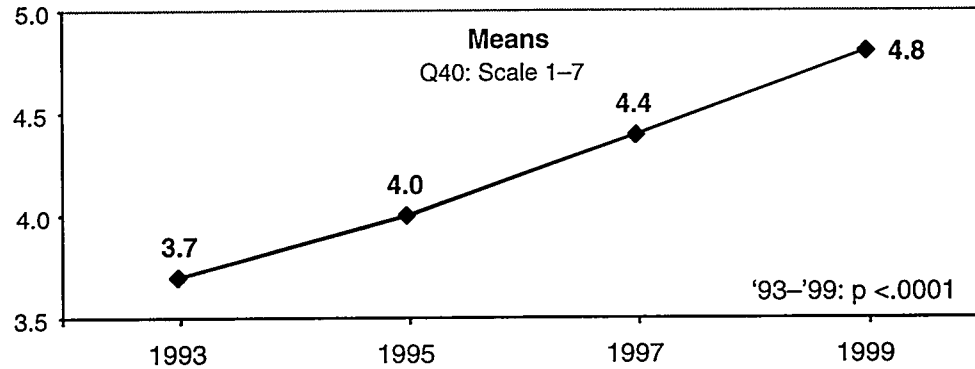


Figure 3.12: Spending for Maintaining the Ability to Develop and Improve Nuclear Weapons in the Future (Scale Midpoint = 4.0)



The direction of overall trends in means for each of the five nuclear weapons investment categories is clearly upward. In each case, growth in mean support for increasing spending between the 1993 and 1999 surveys would have occurred by chance fewer than one in 10,000 times. While it is noteworthy, but not necessarily surprising, that members of the public would support increasing spending for maintaining existing nuclear weapons, research to make them safer, and training to insure the competence of those who manage the nuclear arsenal (Figures 3.9–11), the pattern of mean preferences shown in Figures 3.8 and 3.12 are more surprising. After an initial decline in support from 1993 to 1995 for investments in new nuclear weapons (Figure 3.8), support increased significantly in the subsequent two measurement periods (though the level of support remained below the midpoint of the scale). When combined with the steadily increasing support shown in Figure 3.12 for increasing investments for maintaining the ability to develop and improve nuclear weapons in the future, these trends indicate growing public support for keeping the US nuclear weapons infrastructure viable, and they are in consonance with data shown in Figures 3.2–3.6 reflecting increasing public valuation of US nuclear weapons.

Section 3.5: Other Spending Preferences

THE SPREAD OF NUCLEAR WEAPONS AND THE POTENTIAL FOR NUCLEAR terrorism have been shown in all our surveys to be areas of public concern, and respondents have evidenced increasing support for

spending to prevent nuclear proliferation and terrorism. Figures 3.13 and 3.14 show the trends in mean responses to the following two questions which were answered on the same scale used in the previous series where one meant “substantially decrease,” and seven meant “substantially increase.”¹¹

- How should spending change for preventing the spread of nuclear weapons? (Q41)
- How should spending change for preventing nuclear terrorism? (Q41)

Figure 3.13: Spending for Preventing the Spread of Nuclear Weapons
(Scale Midpoint = 4.0)

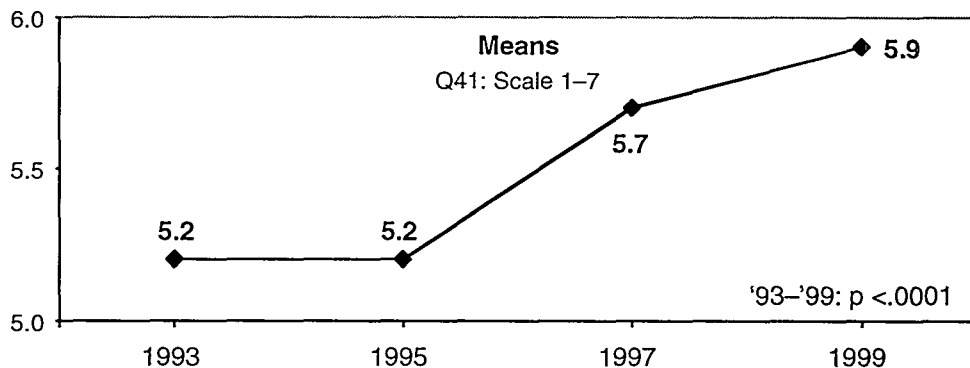
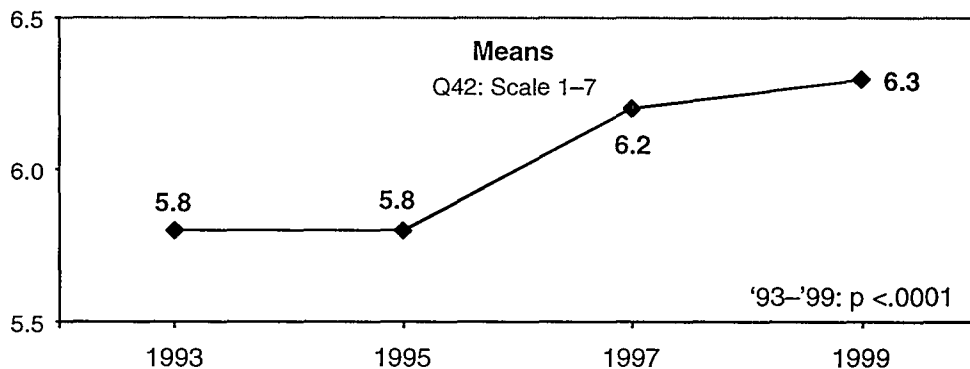


Figure 3.14: Spending for Preventing Nuclear Terrorism
(Scale Midpoint = 4.0)



¹¹ Question wording and distributions of responses are in Volume I: Appendix 3, Q41-42.

Both issues exhibit similar trends, with support for greater spending registering above midscale in 1993 and 1995, and growing significantly in each of our two subsequent surveys. In 1999, fully 83 percent of respondents favored increasing spending for preventing nuclear proliferation, and 90 percent favored increasing spending for preventing nuclear terrorism. Such high levels of agreement constitute an unusually strong public consensus about these subjects.

Section 3.6: Relating Nuclear Risk and Benefit Indices to Policy and Spending Preferences

TO EXAMINE RELATIONSHIPS BETWEEN PERCEPTIONS OF NUCLEAR weapons risks and benefits and policy and spending preferences, we used the external and domestic nuclear weapons risk and benefit indices developed in Chapter Two as independent variables in regressions to predict preferences for selected security policy and spending issues in 1999.

Bivariate Relationships

Prior to presenting a summary of key relationships for multiple issues, it is useful to illustrate the individual effects of each risk and benefit index on a single issue using bivariate regressions. After the introductory example, we will use multivariate regressions to summarize the combined effects of the four risk and benefit indices on a variety of selected policy issues.

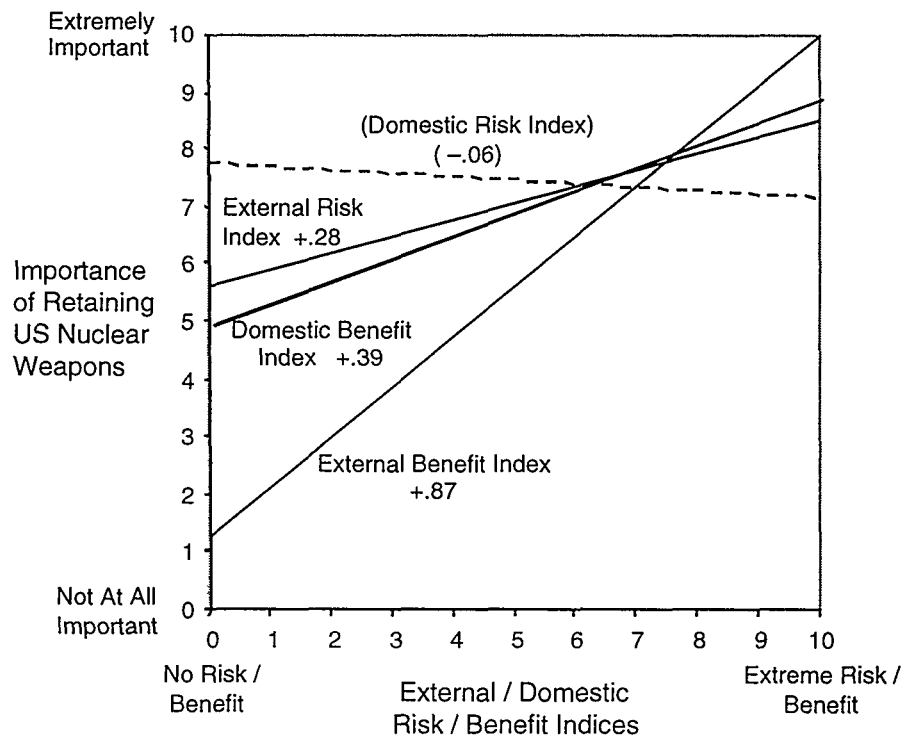
Table 3.3 summarizes results of regressions in which each of our four nuclear weapons risk and benefit indices were used as independent variables in separate bivariate regressions to predict change in the reported importance of retaining nuclear weapons. The dependent variable for each of these illustrations was question 32, which asked respondents to rate the importance of retaining nuclear weapons today on a scale where zero meant “not at all important,” and ten meant “extremely important.”¹² Table 3.3 summarizes results of the bivariate regressions, and Figure 3.15 graphs the resulting regression lines.

¹² Question wording and distributions of responses are in Volume I: Appendix 3, Q32.

Table 3.3: Relating Risk and Benefit Indices to Importance of Retaining US Nuclear Weapons: 1999 (Bivariate Regressions)

Independent Variables	Intercept	Coefficient (Slope)	t Value	p Value	Adj. R ²
External Risk Index	5.61	.28	6.78	<.0001	.03
Domestic Risk Index	7.83	-.06	1.18	.0707	<.01
External Benefit Index	1.3	.87	27.96	<.0001	.37
Domestic Benefit Index	4.93	.39	11.99	<.0001	.10

Figure 3.15: External and Domestic Nuclear Risk Indices vs. Importance of Retaining US Nuclear Weapons Today: 1999 (Bivariate Regressions)



In bivariate regressions, the importance of retaining US nuclear weapons was most strongly related to perceptions of external benefits. For each one point increase in the external nuclear benefit index, the importance of retaining nuclear weapons increased 0.87 on the zero-to-ten importance scale.

The next strongest relationship was with perceptions of domestic benefits, and for each one point increase in the domestic nuclear benefit index, the importance of retaining nuclear weapons increased 0.39. Thirdly, as perceptions of external nuclear risks increased one point, the importance of retaining nuclear weapons increased 0.28. Each of these three relationships were highly statistically significant ($p < .0001$). The relationship between our fourth index, domestic nuclear risks, and the importance of retaining nuclear weapons did not meet statistical significance at the 95 percent confidence level ($p = .0707$).

Multivariate Relationships

Next we used all four risk and benefit indices as independent variables in a multiple regression in which the importance of retaining nuclear weapons was again the dependent variable. Results in Table 3.4 show the relationship of each of the indices to the dependent variable when all the other indices are held constant.

Table 3.4: Relating Risk and Benefit Indices to Importance of Retaining US Nuclear Weapons: 1999 (Multiple Regressions)

Independent Variables	Coefficient (Slope)	t Value	p Value
	Intercept = 0.91	$R^2 = .39$	
External Risk Index	.02	2.08	.0379
Domestic Risk Index	-.10	-3.50	.0005
External Benefit Index	.79	22.84	<.0001
Domestic Benefit Index	.14	5.00	<.0001

In a multivariate regression, each of our four nuclear weapon risk and benefit indices were found to be systematically related to respondents' perceptions of the importance of retaining nuclear weapons today. As indicated by the R^2 , the indices accounted for 39 percent of overall variation in perceived importance of retaining nuclear weapons. External risks, external benefits, and domestic benefits were all positively related to the retention issue,

while the importance of retaining nuclear weapons declined as perceptions of the risks associated with managing our own nuclear arsenal (domestic nuclear risk index) increased.

Our final exercise in this chapter is to use the four risk and benefit indices as independent variables in multivariate regressions to predict preferences for each of the following security policy issues.¹³

- Feasibility of eliminating all nuclear weapons worldwide in next twenty-five years (Q30)
- Minimum acceptable level of nuclear weapons (Q24)
- Funding for new nuclear weapons (Q36)
- Funding to maintain reliable nuclear weapons (Q37)
- Funding to sustain nuclear weapons research infrastructure (Q40)

Results are summarized in Table 3.5. The number in each of the four columns of indices represents the coefficient (slope) of the regression line for the associated issue. Each issue can be visualized as a regression line having the direction and slope of the coefficient shown. The statistical significance of each relationship is coded as follows: one asterisk indicates a p-value of .05 or less; two asterisks mean a p-value of .01 or less; and three asterisks represent a p-value of .001 or less. Relationships that are not statistically significant at the 95 percent confidence level are represented by the letters “n. s.”

¹³ Question wordings and distributions of responses are in Volume I, Appendix 3, Q30, 24, 29, 36, 37, 40.

Table 3.5: Combined effects of Nuclear Risk and Benefit Perceptions on Selected Policy and Spending Issues: 1999 (Multiple Regressions)

Issue (Dependent Variable)	p <.05*			p <.01**		p <.001***	Adj. R ²
	Ext. Risk Index	Dom. Risk Index	Ext. Benefit Index	Dom. Benefit Index			
Q30: Feasibility of eliminating all nuclear weapons in next 25 yrs. (1 = Strongly Disagree—7 = Strongly Agree)	n. s.	.18***	.04***	n. s.			.06
Q24: Minimum levels of US nuclear weapons (1 = 7,000—6,500 with decreasing increments of 500 to 15 = 0)	n. s.	.16*	-.61***	-.20**			.07
Q36: Funding for new nuclear weapons (1 = Substantially Decrease—7 = Substantially Increase)	n. s.	n. s.	.29***	.17***			.16
Q37: Funding to maintain reliable nuclear weapons (1 = Substantially Decrease—7 = Substantially Increase)	.12***	-.07**	.29***	.14***			.17
Q40: Funding to sustain nuclear weapons research infrastructure (1 = Substantially Decrease—7 = Substantially Increase)	n. s.	n. s.	.40***	.19***			.22

These integrated effects of our four risk and benefit indices illustrate how much more strongly perceptions of nuclear weapons benefits were related to policy and spending preferences than were perceptions of nuclear weapons risks. Among these issues, only the question of how funding should change for maintaining the US nuclear arsenal in reliable condition was systematically related to all four risk and benefit indices in a multivariate regression. Note also the strong explanatory relationship between perceptions of external nuclear weapons benefits and each of these policy issues. In each case our external nuclear benefit index was highly statistically significantly related to the policy issues ($p < .001$), and in each case the coefficient for external benefits was largest (steepest slope). Clearly, perceptions of benefits associated with US nuclear weapons are more powerfully predictive of policy preferences than are perceptions of nuclear risks—whether from others’ nuclear weapons or from our own.

Section 3.7: Summarizing Trends in Policy and Spending Preferences

Prospects for Nuclear Abolition

IN EACH OF OUR FOUR SURVEYS, OPINION WAS DIVIDED ABOUT THE FEASIBILITY of eliminating all nuclear weapons worldwide in the next twenty-five years, with slight majorities disagreeing with the assertion that total elimination is feasible, except in 1995 when opinion was equally split. Assuming a nuclear weapon-free world can somehow be achieved, more than 80 percent of respondents in each survey concurred with the statement that preventing others from rebuilding nuclear weapons would be extremely difficult. Responses to each statement have been consistent across the four measurement periods. These results imply that although many respondents appeared to have an open mind about the possibility of nuclear abolition, skepticism was widespread, and when asked how they felt about the US agreeing to a provision requiring it to eventually eliminate all its nuclear weapons, the trend in mean support for such an agreement was slightly above midscale, but declined significantly from 1995 to 1999.

Perceived Importance of US Nuclear Weapons

In contrast, trends in questions about multiple dimensions of the importance of US nuclear weapons were all higher. Response patterns were highly coherent in the direction of the trend for each question and among all five questions over time. Results were unequivocal and reinforcing: the clear trend in public valuation of US nuclear weapons and the importance of the US remaining a military superpower is not yet declining in the post-Cold War period, and can be empirically shown to have increased statistically significantly from 1993 to 1999.

Perceived Importance of Nuclear Deterrence

In each of our four surveys of the general public, respondents rated the importance of nuclear deterrence in the Cold War and today above seven on a scale from zero to ten. Valuations were consistent across time, and small differences in mean ratings since 1993 were not significant. When we told respondents to assume a future more proliferated environment and asked

them to rate the effectiveness of nuclear deterrence for preventing nuclear conflict anywhere in the world, mean valuations were still well above mid-scale in each of our surveys, and again, differences in mean ratings were not significant. When asked in 1999 to rate the importance of US nuclear weapons for preventing other countries from using chemical or biological weapons against the US, the mean valuation was 6.6 on the same zero to ten scale. These results indicate that respondents highly valued the past and present role of nuclear deterrence, that they placed substantial importance on the future role of nuclear deterrence (even if more countries acquire nuclear weapons), and that they considered US nuclear weapons to be important in preventing attacks with other types of mass casualty weapons.

Numbers of Nuclear Weapons

When asked in 1997 and 1999 to identify the minimum numerical level to which they would be willing to reduce the US nuclear arsenal in the context of mutual and verified reductions with Russia, the median range in both years was 1,500 to 2,000 nuclear weapons. Response patterns were highly consistent across both surveys. In both 1997 and 1999, about 20 percent of respondents preferred zero; about 11 percent preferred no reductions below current levels; about one-fourth of respondents preferred 1,000 nuclear weapons or fewer (but not zero). Almost half of all respondents in each year preferred the START II levels of 3,500 or below (but not zero), while approximately one-third of respondents in each year preferred levels above those of START II.

Investment Preferences

To better understand public views about investments in nuclear weapons capabilities, we asked participants in each of our surveys to indicate how current spending levels should change for each of the following: (a) developing and testing new nuclear weapons; (b) reliably maintaining existing nuclear weapons; (c) research to increase the safety of existing nuclear weapons; (d) training to insure the competence of those who manage nuclear weapons; and (e) maintaining the ability to develop and improve nuclear weapons in the future. The trend in mean responses to each question was decidedly upward, with changes from 1993 to 1999 being highly statistically significant ($p < .0001$) for each question. These trends are all consis-

tent with the upward trend in valuation of nuclear weapons previously discussed, and they provide clear empirical evidence of growing public support for US nuclear weapons capabilities and associated infrastructure.

Perceptions of Nuclear Risks and Benefits vs. Policy Issues

Systematic relationships were found between perceptions of external and domestic risks and benefits associated with nuclear weapons and some policy and spending preferences. Perceptions of benefits were more powerfully predictive of policy preferences than were perceptions of risks. The external nuclear benefit index was highly statistically significantly related to each of the six policy issues tested, and was the most powerful predictor of policy preferences in both bivariate and multivariate regressions.

Volume I: Chapter Four

Emerging Issues

IN OUR 1999 SURVEY, WE INQUIRED ABOUT PUBLIC VIEWS OF THREE emergent issues relevant to debate about the future of nuclear security: (1) the deterrent potential of conventionally armed precision guided munitions; (2) response to attacks in which weapons of mass destruction are used; and (3) expectations about national missile defenses. In this chapter we report data showing some aspects of public views about each of these salient areas.

Section 4.1: Precision Guided Munitions

TECHNOLOGICAL IMPROVEMENTS IN CONVENTIONAL ARMAMENTS THAT allow munitions to be delivered with increasing accuracy have led to a class of weapons known as precision guided munitions (PGMs), or as termed by the media, “smart bombs.” The utilities and limitations of PGMs were demonstrated in 1991 during the Persian Gulf War and in the war in Yugoslavia over the province of Kosovo in 1999. The apparent effectiveness of precisely delivered conventional ordnance has led some security policy experts to argue that PGMs can replace nuclear weapons for purposes of deterrence.¹

To gain insight about the degree to which members of the general public have assimilated US combat experiences with PGMs and the kinds of connections they may have made between those impressions and deterrence, we asked a battery of questions with three objectives. First, we wanted to determine if members of the general public differentiated the utility of PGMs for deterring the use of different kinds of mass casualty weapons. Second, we wanted to know how the public assessed the utility of PGMs for deter-

¹ For arguments calling for PGMs to replace nuclear weapons for purposes of deterrence, see Nitze, 1994 and 1999, and Krepinevich and Kosiak, 1998. For a critique of those arguments see Gormley and Mahnken, 2000.

ring attacks against the US homeland, US troops stationed overseas, and US allies. And third, we wanted to know how respondents would compare PGMs to nuclear weapons for purposes of deterrence. Our lead-in and the initial question sets are shown below. Each was answered on a scale where zero meant “not at all effective,” and ten meant “extremely effective.”²

Lead-in: As shown in the Persian Gulf War and more recently in Yugoslavia, precision guided munitions, often called “smart bombs,” can be delivered very accurately by airplanes and cruise missiles. Some people argue that “smart bombs” that do NOT have nuclear warheads can take the place of nuclear weapons for the purpose of preventing attacks against the US. Others disagree, arguing that nothing except our own nuclear weapons can reliably prevent others from using nuclear weapons against us.

How effective do you think US “smart bombs” are for deterring an adversary from using nuclear weapons against each of the following?

- The US homeland? (Q51)
- US forces stationed overseas? (Q52)
- US allies such as Japan? (Q53)

Now we want to switch the comparison to biological weapons such as germs and viruses. How effective do you think US “smart bombs” are for deterring an adversary from using biological weapons against each of the following? (same three categories and response options: Q54–56)

Now we want you to consider deterring the use of chemical weapons such as poisonous gases and nerve agents. How effective do you think US “smart bombs” are for deterring an adversary from using chemical weapons against each of the following? (same three categories and response options: Q57–59)

Grouped distributions and mean response values are compared in Tables 4.1–4.3.

² Question wordings and distributions of responses are in Volume I: Appendix 3, Q51–60.

Table 4.1: Effectiveness of PGMs for Deterring Nuclear Attacks (Q51–53)

Deter Nuclear Attacks Against	Not Effective % (0–4)	Midscale % (5)	Effective % (6–10)	Mean (0–10)
US Homeland	31	16	52	5.6
US Forces Overseas	28	17	54	5.7
US Allies	31	22	46	5.3

Table 4.2: Effectiveness of PGMs for Deterring Biological Attacks (54–56)

Deter Biological Attacks Against	Not Effective % (0–4)	Midscale % (5)	Effective % (6–10)	Mean (0–10)
US Homeland	42	15	43	5.0
US Forces Overseas	45	17	39	4.9
US Allies	46	16	39	4.7

Table 4.3: Effectiveness of PGMs for Deterring Chemical Attacks (Q56–59)

Deter Chemical Attacks Against	Not Effective % (0–4)	Midscale % (5)	Effective % (6–10)	Mean (0–10)
US Homeland	42	14	45	5.0
US Forces Overseas	41	17	42	4.9
US Allies	44	17	38	4.7

These issues would be difficult even for security experts to differentiate, and, not surprisingly, members of the general public may not have formed clear opinions about the utility of PGMs for such a variety of deterrence purposes. This is implied by response patterns that were roughly equally divided, by mean values near midscale, and by the proportions of respondents who were unsure. However, these responses may provide more insight when considered as relative measures. Whether considering the effectiveness of conventionally armed PGMs for deterring nuclear, biological, or chemical attacks, they were judged relatively less effective for preventing attacks with mass casualty weapons against allies than against the US or its

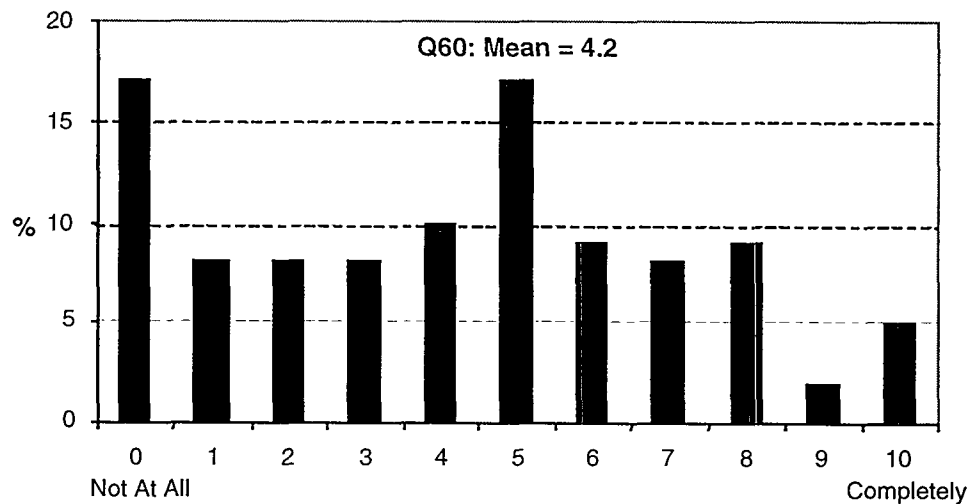
forces. And PGMs were judged to be relatively more effective for deterring nuclear attacks than attacks in which biological or chemical agents are used.

Our last question in this series asked respondents the degree to which PGMs could replace nuclear weapons for purposes of deterring nuclear threats from other countries.³

Can smart bombs replace US nuclear weapons for deterring other countries from using their nuclear weapons against us? On a scale from zero to ten where zero means *not at all*, and ten means *completely*, to what degree, if any, do you think smart bombs can replace US nuclear weapons for purposes of deterrence? (Q60)

Figure 4.1 shows the distribution of responses and the mean.

Figure 4.1: Degree to Which PGMs Can Replace US Nuclear Weapons for Deterring Nuclear Threats from Other Countries



About one-third of our respondents rated the utility of PGMs above mid-scale for replacing nuclear weapons for purposes of deterrence. More than half of our participants rated the utility of PGMs below midscale, and about 17 percent of respondents rated it “five.” At the two extremes, the percentage of participants who thought PGMs could not replace nuclear weapons to *any* degree (17 percent) was more than three times larger than those who

³ Question wording and distribution of responses is in Volume I, Appendix 3, Q60.

thought that PGMs could replace nuclear weapons *completely* (5 percent). The mean was below midscale at 4.2, but large enough to suggest that most respondents considered PGMs to have partial tradeoff potential with nuclear weapons for deterrence purposes.

It is important to keep in mind that none of the questions dealing with the utility of PGMs as a deterrent force directly probed the public's understanding of the distinction between nuclear and conventional deterrence. Where nuclear deterrence is largely associated with the threat of punishing one's adversary, the success of conventional deterrence depends on the capacity to counter the adversary's use of military force, particularly his weapons of mass destruction. This distinction may help explain the public's view that smart weapons have considerable value both for deterrence and (as will be shown below) for retaliation should deterrence fail, but that the public also would support nuclear retaliation under some circumstances.

Section 4.2: Responding to Mass Casualty Attacks

ONE OF THE CENTRAL ASPECTS OF THE DEBATE ABOUT NUCLEAR SECURITY pertains to the utility of nuclear weapons if deterrence should fail. Many people consider the employment of nuclear weapons to be morally unacceptable and contrary to basic American beliefs about humanitarian values. But such considerations are complicated by the growing availability of access to mass casualty weapons and the potential for their use against US interests. Because the US does not maintain chemical or biological weapons that could be used to respond in kind to those types of attacks, nuclear weapons are considered by some to be a potential alternative for retaliation in the service of future deterrence.

To better understand public sentiment about response options to attacks involving weapons of mass destruction, we asked two series of questions. The first series asked participants to consider their feelings about responding with nuclear weapons to various types of mass casualty attacks against the US, its military forces, and its allies.⁴

⁴ Question wordings and distributions of responses are in Volume I: Appendix 3, Q71–76.

Lead-in: The following questions ask for your views about using US nuclear weapons to retaliate against various types of attacks. Please respond to each using a one to seven scale where one means you *strongly oppose*, and seven means you *strongly support* the action.

- How would you feel about the US using nuclear weapons to retaliate against a country that used nuclear weapons against the United States? (Q71)
- How would you feel about the US using nuclear weapons to retaliate against a country that used nuclear weapons against US troops that were deployed overseas? (Q72)
- How would you feel about the US using nuclear weapons to retaliate against a country that used nuclear weapons against a US ally such as Japan? (Q73)
- How would you feel about the US using nuclear weapons to retaliate against a country that supported nuclear terrorism against the United States? (Q74)
- The US has stopped making chemical weapons and is destroying its remaining stocks. If another country used chemical weapons, such as poisonous gases or nerve agents, against our military forces, how would you feel about using nuclear weapons to retaliate? (Q75)
- The US has no biological weapons today. If another country used biological weapons, such as germs or viruses, against our military forces, how would you feel about using nuclear weapons to retaliate? (Q76)

Grouped responses and means are compared in Table 4.4.

Table 4.4: Nuclear Retaliation Against Mass Casualty Attacks

Nuclear Retaliation for Type of Attack	Oppose % (1–3)	Middle % (4)	Support % (5–7)	Mean (1–7)
Nuclear attack against the US (Q71)	17	7	77	5.5
Nuclear terrorism against the US (Q74)	28	10	62	4.8
Nuclear attack against US allies (Q73)	30	14	57	4.4
Nuclear attack against US troops (Q72)	17	7	76	5.5
Chemical attack against US troops (Q75)	33	8	59	4.6
Biological attack against US troops (Q76)	32	8	59	4.6

Several observations can be made from these patterns of responses.

- Conceptually, most respondents could support nuclear retaliation for attacks in which weapons of mass destruction are employed against US interests. The mean response to each question in the series was above the midscale of 4.0, and a majority of respondents indicated support for nuclear retaliation in each circumstance.
- Support for nuclear retaliation against a country that uses nuclear weapons to attack the US or its military forces deployed overseas was substantially higher than support for a nuclear response to all other types of mass casualty attacks.
- Though a majority of respondents supported nuclear retaliation against a country that facilitated nuclear terrorism against the US, levels of support were comparatively lower than those expressed for nuclear retaliation to direct nuclear attacks on the US or its troops by another country.
- Support for a nuclear response to chemical or biological attacks on US forces was substantially lower than support expressed for a nuclear response to *nuclear* attacks on US troops. But respondents did not ap-

pear to differentiate importantly between chemical or biological attacks. Distributions and mean responses were almost identical for support of nuclear retaliation to chemical *or* biological attacks.

- Though a majority of respondents registered support for nuclear retaliation against a country that uses nuclear weapons to attack a US ally, there was marginally less support for this option than for the other scenarios.

The second set of questions about this issue gave respondents three *randomly ordered* options from which to choose preferred responses to attacks on US forces in which weapons of mass destruction are used: (a) respond with diplomacy only; do not use force; (2) respond with smart bombs without nuclear warheads; and (3) respond with nuclear weapons.⁵

Lead-in: Some people think that retaliation with US nuclear weapons would be justified if another country used weapons of mass destruction against US forces. Others think that nuclear retaliation would not be justified, and that the US should respond with smart bombs that do NOT have nuclear warheads. Still others think that diplomacy rather than force should be the way the US reacts to such attacks. Each of the following questions asks how you think the US should respond if another country intentionally used weapons of mass destruction against US forces.

- If another country used *nuclear* weapons against US forces, which of the three following responses would you prefer? (Q77)
- If another country used *biological* weapons against US forces, which of the following three responses would you prefer? (Q78)
- If another country used *chemical* weapons against US forces, which of the following three responses would you prefer? (Q79)

We show distributions of responses to each of the three questions in Table 4.5.

⁵ Question wordings and distributions of responses are in Volume I, Appendix 3, Q77–79.

Table 4.5: Preferences for US Response to Mass Casualty Attacks

Type of Attack Against US Forces	Preferred US Response (%)		
	Diplomacy Only	Conven. PGMs	Nuclear Weapons
Nuclear weapons	12	46	42
Biological weapons	10	60	30
Chemical weapons	9	60	31

For each scenario, responding with conventionally armed PGMs was the option preferred by most respondents. Participants did not seem to differentiate between responses to attacks in which biological or chemical weapons were used, and PGMs were preferred by a margin of two to one over nuclear weapons for responding to either type of attack. Opinion was more evenly divided about the preferred response to a nuclear attack against US forces, with 46 percent of respondents preferring to respond with conventional PGMs and 42 percent preferring nuclear retaliation. Only small percentages of participants favored an exclusively diplomatic response.

Together, the two series of questions in this section indicate that while participants were prepared to use nuclear weapons in response to attacks in which weapons of mass destruction are employed against the US or its forces or allies, most preferred responding with conventionally armed PGMs rather than nuclear weapons. These findings, in conjunction with those presented in Section 1 of this chapter, illustrate some of the ways in which members of the general public are assimilating the implications of advances in technologies for precisely delivering munitions.

Section 4.3: National Missile Defenses

THE PROLIFERATION OF MISSILE TECHNOLOGIES TO STATES THAT MAY threaten US interests, such as North Korea, Iran, and Iraq, has stimulated debate about national missile defenses. Advocates argue that a limited system of missile defenses for the US homeland would protect Americans against small numbers of long-range missiles from rogue states and from errant missiles accidentally launched from other nuclear weapon states. They contend that such a system can be deployed *without* undermining the ability of Russia or China to deter nuclear attacks from the US. Oppo-

nents argue that effective missile defenses are not yet technologically feasible, and that even a limited national missile defense system would violate the Anti-Ballistic Missile Treaty with the former Soviet Union. They contend that fielding even an ineffective and limited system would eventually lead to technological advancements that would seriously undermine Russian and Chinese deterrence. The result, argue opponents, will be offensive enhancements to others' nuclear forces and another strategic arms race.⁶

To examine public views about national missile defenses, we again asked three types of questions. First, based on focus group discussions indicating that some citizens thought the US already had ballistic missile defenses, we asked a knowledge question to determine what portion of respondents knew that the US currently has no means of defense against intercontinental ballistic missiles. Second, we asked a battery of six questions designed to probe public beliefs about the viability of strategic missile defenses and some of their implications. Finally, we asked a direct question about the preferences of respondents for building a US national missile defense system.

Public Knowledge Base

As reported in Appendix 2 of this volume, we found that a common misperception among some focus group members was that the US currently has operational defenses against ballistic missile attacks. Most such perceptions seemed to derive from observing the role of Patriot missile defenses employed to protect US forces and Israeli citizens against attacks by Iraqi SCUD missiles during the Persian Gulf War. Most focus group participants did not appreciate the differences in missile speed and trajectory between theater-range missiles and intercontinental-range ballistic missiles. To further examine this apparent misperception, we asked our survey respondents the following knowledge question.

⁶ For recent critical views of NMD see Isaacs, 2000; Postol, 2000; Garwin, 2,000; Lewis, Gronlund, and Wright, 1999/2000; Steinbruner, 1999; and Gronlund and Lewis, 1999. For recent supportive arguments see Payne, 2000; Nance, 1999; Kyle, 1999; and Spratt, 1999. For recent assessments of programmatic issues relating to NMD see the report of the National Missile Defense Review Committee, 1999, and Japzon, Swaminatha, and Moffitt, 1999. For a recent legal assessment of the implications of theater and national missile defenses for the ABM Treaty, see Grogan, 1999.

There is an ongoing debate about defending the US from attacks by long-range nuclear-armed ballistic missiles. To the best of your knowledge, does the US currently have a defensive system for shooting down long-range ballistic missiles that have been launched against the US homeland? (Q61)

Table 4.6 shows overall distribution of responses as well as divisions by gender, age, and education.

Table 4.6: Does the US Have Defenses Against Ballistic Missiles? (Q61)

Category of Respondents	No (%)	Yes (%)	Don't Know (%)
All respondents	26	63	10
Women	17	67	15
Men	37	57	5
Ages 18–49	24	65	11
Ages 50–98	31	56	11
< College degree	25	63	11
College degree	28	61	10

Almost two thirds of all respondents (sixty-three percent) answered incorrectly that the US had operational defenses against ballistic missile attacks. About one-fourth (26 percent) of all respondents knew that the US did not currently have such defenses. Ten percent of all respondents did not know whether the US had a national missile defense system or not. This means that three-fourths of all respondents (74 percent) were not able to provide the correct answer.

Gender was a significant factor. Only 17 percent of women answered the question correctly, while 37 percent of men responded correctly (chi-square = 49.05, $p < .0001$).

Age also was a significant factor, with 24 percent of those below fifty years of age answering correctly and 31 percent of respondents fifty years of age and above answering correctly (chi-square = 9.21, $p = .0024$).

Education was not a significant factor. Twenty-five percent of those not having a college degree answered correctly, and 28 percent of those holding a bachelor's or higher degree answered correctly (chi-square $p = .3960$).

Clearly, one of the first challenges of public debate about this issue will be to establish a more factual public knowledge base. To effectively marshal public support, both proponents and opponents of national missile defenses (NMD) will need to address widespread public misperceptions about existing missile defense capabilities.

Perceptions About the Viability and Implications of NMD

Before asking participants to respond to various assertions about the viability and implications of potential missile defenses, we first insured a shared minimum level of knowledge about the debate. After an initial lead-in, two informative paragraphs were read to all respondents. The order in which they were read was randomized to prevent any influence derived from being presented first or last. This sequence immediately followed the above knowledge question.⁷

Initial Lead-in: Actually, we do not currently have any defenses that can shoot down long-range ballistic missiles.

(Randomized): People opposed to national missile defenses say that they are not needed, because the threat of US nuclear retaliation will deter all missile launches against us except for those that are accidental. They argue that missile defenses cost too much, will not work, and will lead to another arms race.

(Randomized): People in favor of national missile defenses say that our government has a responsibility to protect us, and that it is both feasible and affordable to construct a limited missile defense system. They argue that such a system would defend against a few missiles launched accidentally or from an attack by a rogue state like North Korea.

Response Instruction: Please respond to the following statements about missile defenses on a scale from one to seven, where one means *strongly disagree*, and seven means *strongly agree*.

⁷ Question wordings and distributions of responses are in Volume I: Appendix 3, Q63–69.

(NOTE: The order in which the following seven statements were read to each respondent was randomized to prevent order effect.)

- A national missile defense system would reliably defend the US against accidental launches of small numbers of nuclear missiles against us. (Q63)
- A national missile defense system would reliably defend the US against small numbers of nuclear missiles launched by a rogue state like North Korea. (Q64)
- The US government has a responsibility to build a national ballistic missile defense system to protect us from attacks by nuclear missiles. (Q65)
- Money to build a national ballistic missile defense system for the US would be better spent on other programs. (Q66)
- A national ballistic missile defense system would not be capable of protecting the US against a large-scale attack from nuclear missiles. (Q67)
- A US national ballistic missile defense system would lead to a new arms race with Russia and China. (Q68)
- The threat of US nuclear retaliation is sufficient to deter all long-range ballistic missile attacks against the US except for accidental launches. (Q69)

We compare grouped responses and means for each question in Table 4.7. Assertions are ordered from greatest to least level of respondent agreement.

Table 4.7: Public Reactions to Assertions About National Missile Defenses (Q63–69)

Assertion About NMD	Disagree % (1–3)	Middle % (4)	Agree % (5–7)	Mean (1–7)
US government has a responsibility to build NMD to protect us (Q65)	18	10	72	5.3
NMD would reliably defend against missiles from rogue states (Q64)	20	10	69	5.0
NMD would reliably defend against accidental launches (Q63)	21	11	68	4.9
NMD would not protect against large-scale attacks (Q67)	31	14	54	4.5
Money for NMD would be better spent on other things (Q66)	41	14	45	4.1
Nuclear retaliation will deter all except accidental launches (Q69)	39	15	46	4.1
NMD would lead to arms race with Russia & China (Q68)	41	14	45	4.0

Almost three-fourths (72 percent) of respondents agreed with the statement that the US government has a responsibility to build a national missile defense system to protect Americans from nuclear missile attacks. More than two-thirds agreed that NMD would reliably defend against small accidental launches from any source (69 percent) and from small numbers of missiles from rogue states (68 percent). Slightly more than half (54 percent) agreed that NMD would not be capable of protecting the US against a large-scale missile attack.

Opinion was more divided about: (a) whether money for a NMD would be better spent on other programs; (b) whether the threat of US nuclear retaliation is sufficient to deter all long-range missile attacks except for accidental launches; and (c) whether national missile defenses will lead to a new arms race with Russia and China. Mean response values for all three statements were at or near midscale, but pluralities agreed with each assertion.

When a high proportion of responses are grouped near midscale on measures of policy preferences, it sometimes can be useful to differentiate those that hold stronger views about the issues. In Table 4.8, responses to the same

seven assertions about NMD are grouped such that those responding with the two lowest assessments (scale values of one and two) are grouped under the column labeled “firmly disagree,” and those responding with the two highest assessments (scale values of six and seven) are shown in the column labeled “firmly agree.” The middle column shows those whose scale values were from three to five.

Table 4.8: Polarized Reactions to Assertions About National Missile Defenses (Q63–69)

Assertion About NMD	Firmly Disagree % (1–2)	Middle % (3–5)	Firmly Agree % (6–7)	Mean (1–7)
US government has a responsibility to build NMD to protect us (Q65)	12	33	55	5.3
NMD would reliably defend against missiles from rogue states (Q64)	12	40	47	5.0
NMD would reliably defend against accidental launches (Q63)	14	40	46	4.9
NMD would not protect against large-scale attacks (Q67)	19	45	35	4.5
Money for NMD would be better spent on other things (Q66)	29	42	29	4.1
Nuclear retaliation will deter all except accidental launches (Q69)	27	46	27	4.1
NMD would lead to arms race with Russia & China (Q68)	30	44	26	4.0

When grouped so as to better identify those with more firmly held views, we can see that a plurality of respondents to the first three assertions were firmly in agreement, but a plurality of respondents was less certain for each of the last four assertions, and those with more firmly held views can be seen to be much more evenly balanced. These proportions of affinities are not unusual for issues about which the public does not yet have sufficient information, and about which policy debate has not yet crystallized public sentiment.

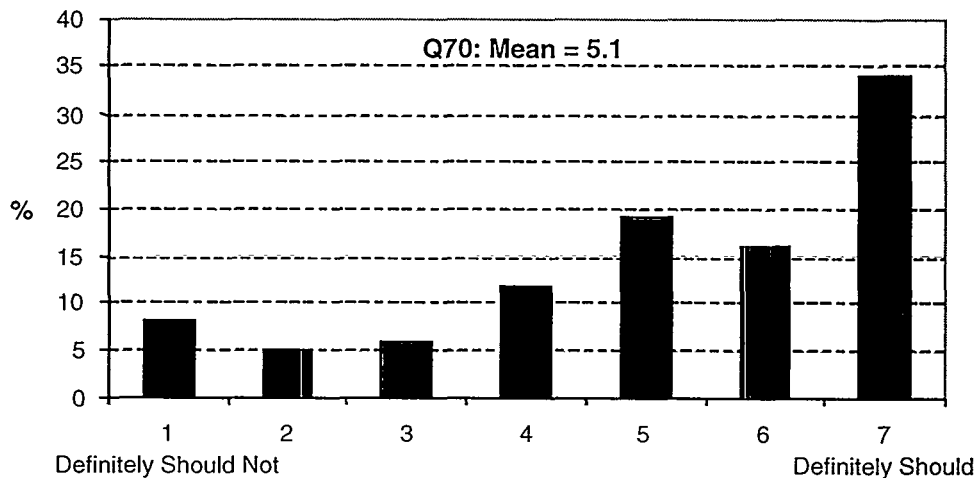
Preferences for Building National Missile Defenses

Our final question in this series asked respondents to express their preferences about building a national missile defense system.

What is your overall preference about building a system to defend the US against attacks by long-range nuclear-armed ballistic missiles? On a scale from one to seven where one means the US definitely should *not* build a national ballistic missile defense system, and seven means the US definitely *should* build such a system, what is your view?

Figure 4.2 shows the distribution of responses and the mean.

Figure 4.2: Should the US Build a NMD System?



Sixty-nine percent of respondents favored building a national missile defense system, while 19 percent opposed it, and 12 percent were at midscale. Mean support for a national missile defense system among men was 5.3, which was significantly higher than the 5.0 mean support among women ($p = .0487$).

We also compared mean support among those who correctly answered the knowledge question versus those who were unaware that the US currently has no national missile defenses. After those who incorrectly thought that the US currently had national missile defenses were told in the lead-in sequence that such defenses do not now exist, their mean support for building a national missile defense system was 5.3. Among those who knew that the US does not

currently have such a system, mean support for building missile defenses was 5.0. Though the difference in means was not statistically significant at the 95 percent confidence level ($p = .0653$), this suggests that the initial reaction of those who learn that the US does not now have defenses against long-range missiles initially may be to support such a system even more strongly than others who were previously aware of existing vulnerabilities.

Section 4.4: Summarizing Views About Emerging Issues

Utility of Precision Guided Munitions for Deterrence

RESPONDENTS CONSIDERED CONVENTIONALLY ARMED PGMS TO BE relatively more effective for deterring attacks with weapons of mass destruction against the US homeland and US forces deployed overseas than for deterring attacks against US allies. They also considered PGMS more effective for deterring nuclear attacks than for deterring biological or chemical attacks. When asked to assess the degree to which (if any) conventionally armed “smart bombs” could replace nuclear weapons for US deterrence, about one-third of participants rated the potential above midscale, while more than half of respondents rated the replacement value of “smart bombs” below midscale. About 17 percent of participants rated it exactly at midscale. These findings imply that while there was considerable doubt about the replacement value of PGMS for nuclear weapons, most respondents considered PGMS to have partial trade-off potential for purposes of deterrence.

Responding to Mass Casualty Attacks

When considering the proper response to attacks against the US, its troops, or its allies in which nuclear, biological, or chemical weapons are used, a majority of respondents indicated that they would support the use of US nuclear weapons to retaliate. More than three-fourths indicated support for nuclear retaliation in response to a nuclear attack against the US or its military forces, but majority support dropped to 57 percent in favor of a nuclear response to a nuclear attack against US allies. Sixty-two percent supported a nuclear response against a country that facilitated an act of nuclear terrorism against the US. When considering biological or chemical attacks against US

military forces, 59 percent said that they would support a nuclear response from the US.

However, support for nuclear retaliation does not necessarily equate to a policy preference. When given three response options—diplomacy only, conventionally armed PGMs, or nuclear weapons—respondents overwhelmingly favored PGMs for responding to biological or chemical attacks against US forces, and a plurality (46 percent) favored PGMs over nuclear weapons for responding to a nuclear attack against US forces. Combined with the data in the previous section, these findings indicate that participants placed considerable value in PGMs both for deterrence and for retaliation should deterrence fail, but that they would support a nuclear option under some circumstances.

National Missile Defenses

The level of misinformation about the ability of the US to defend against intercontinental ballistic missiles was striking. Sixty-three percent of participants incorrectly thought that the US currently had such defenses. Another 10 percent were unsure, meaning that only 26 percent correctly understood that the US does not now have national missile defenses (NMD). Misunderstanding was significantly higher among women and younger participants. These results indicate that one of the first requirements of a national debate about NMD is to provide factual information about current US capabilities and vulnerabilities regarding missile defenses.

After we informed all participants that the US does not now have the capability to defend against long-range missile attacks, we randomly presented very brief descriptions of some of the arguments on each side of the NMD debate. When subsequently asked to respond to a series of assertions about prospective national missile defenses, almost three-fourths of participants agreed that the US government has a responsibility to build missile defenses to protect Americans from such attacks. More than two-thirds agreed that a prospective NMD system could protect the US against small numbers of attacking missiles, whether launched by accident or by a rogue state.

Opinion was more divided on four other assertions. When those with the most firmly held opinions were grouped separately (lowest two scale values

and highest two scale values), a plurality of participants were grouped near midscale. Those with the most firmly held positions were roughly divided about the assertions that: (a) national missile defenses would not protect against large-scale missile attacks; (b) money for national missile defenses could be better spent on other needs; (c) the threat of US nuclear retaliation is sufficient to deter all nuclear threats except accidental launches.; and (d) national missile defenses would lead to an arms race with Russia and China. Mean responses were at or near midscale for each assertion. These indications reflect dimensions of the NMD issue about which most of our respondents had yet to form well defined opinions.

When asked whether the US should build national missile defenses, 69 percent of respondents favored building them, 19 percent were opposed, and 12 percent were undecided. Mean support for missile defenses was rated 5.3 on a one-to-seven scale. Support for a national missile defense system was significantly higher among men than among women.

We draw three overall conclusions from these findings that are relevant to debate about national missile defenses. First, most Americans do not know that the US currently cannot defend against long-range ballistic missiles. Second, the public holds the federal government responsible for protecting them from missile attacks. Third, there appears to be substantial latent support for national missile defenses, but important reservations or doubts exist regarding whether nuclear deterrence alone provides sufficient protection, whether the potential costs of missile defenses can be justified, and whether fielding a national missile defense system might lead to another arms race.

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Volume I: Chapter Five

Belief Systems and Nuclear Security

AS INDICATED BY OUR ANALYTIC MODEL IN CHAPTER ONE, WE HYPOTHESIZE that belief systems play important roles in shaping individual perceptions and policy preferences about nuclear security. Belief systems are complex and difficult to measure comprehensively. They include multiple dimensions such as political culture (worldview), political ideology, social and economic concepts, religious and moral beliefs, views of the role of the US in the international system, and cosmological concepts about nature.

In each phase of our study we included questions designed to measure overall political ideology plus additional dimensions of belief systems and their relationships to security perceptions and preferences. In 1993 and 1995 we asked questions that allowed us to profile respondents' worldviews based on political culture theory.¹ In 1997 we asked new questions designed to explore six different dimensions of ideology.² In 1999 we employed a different approach that allows us to profile individual views about contrasting aspects of the international security environment, nuclear weapons, and the role of the public in security policy evolution. We summarize results in this chapter.

Section 5.1: Political Beliefs

AS IN OUR PREVIOUS SURVEYS, WE ASKED PARTICIPANTS TO NAME THE political party with which they most identified. Forty-seven percent of participants said that they identified most with the Democrat party, while 41 percent identified most with the Republican party. Six percent named another party, and 6 percent said they were independent of any party.

¹ Herron and Jenkins-Smith, 1996, Chapter Six.

² Herron and Jenkins-Smith, 1998, Chapter Six.

To provide a relative measure of political ideology, we have asked respondents in each of our surveys since 1993 to describe their views on a scale from strongly liberal to strongly conservative. As shown in Table 5.1, distributions and mean responses to this question show that respondents can consistently rate their overall political views on a liberal-to-conservative scale.³

Table 5.1: Political Ideology: 1993–1999 (Q100)

%	Strongly		Slightly	Middle	Slightly		Strongly	Mean
	Liberal	Liberal	Liberal	of Road	Conserv.	Conserv.	Conserv.	
	1	2	3	4	5	6	7	
1999	4	13	8	29	17	20	8	4.4
1997	4	10	11	28	17	24	7	4.4
1995	2	10	11	28	21	20	7	4.5
1993	4	12	12	28	17	19	9	4.3

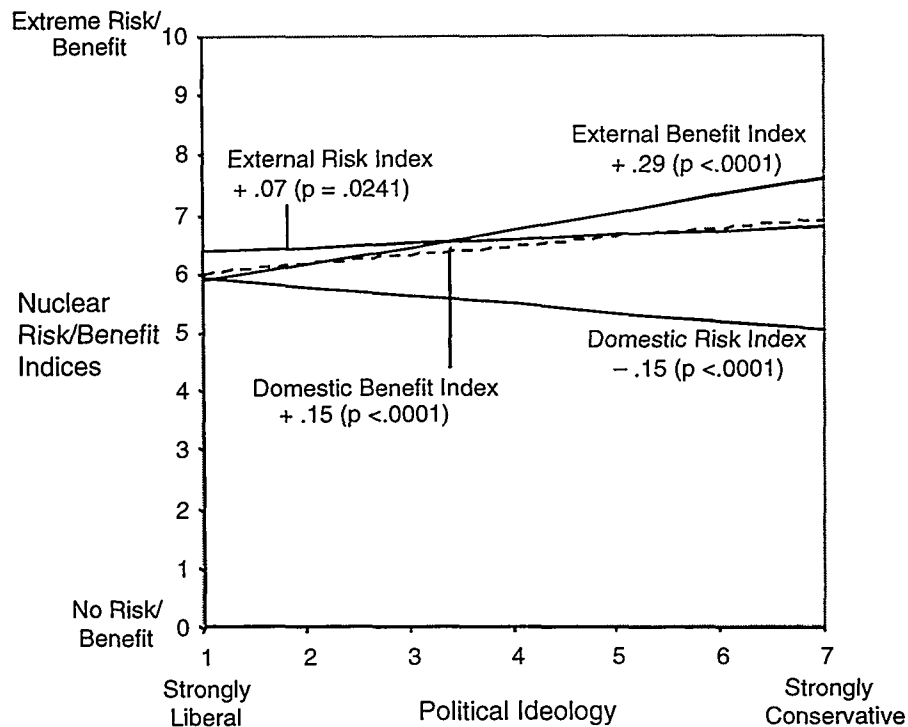
Twenty-nine percent of respondents in 1999 considered their political views to be “middle of the road,” while 45 percent considered themselves to be more conservative than liberal, and 25 percent considered their political views to be more liberal than conservative. The mean value was 4.4, and it has varied little in any of our four surveys of the general public.

³ For critical discussions of the limitations of measuring political ideology on a unidimensional left–right continuum, see: Coveyou and Piereson, 1977, Conover and Feldman, 1981; Feldman, 1988; and Luttbeg and Gant, 1993. For discussions of the utilities of using a left–right continuum to measure political ideology, see: Brown, 1970; Marcus, Tabb and Sullivan, 1974; Conover and Feldman, 1980; Arian and Shamir, 1983; Peffley and Hurwitz, 1985; and Huber 1989.

Section 5.2: Relating Ideology to Risk and Benefit Perceptions

TO ILLUSTRATE HOW POLITICAL IDEOLOGY IS RELATED TO RISK AND benefit perceptions, we used ideology as the independent variable in separate bivariate regressions to predict each of our external and domestic nuclear risk and benefit indices.⁴ Results are graphed in Figure 5.1

Figure 5.1: Relating Political Ideology to Nuclear Weapons Risk and Benefit Indices: 1999 (Bivariate Regressions)



Political ideology was significantly related to all four risk and benefit indices. As conservatism increased one unit on the seven point continuum of self-rated political ideology, composite perceptions of external nuclear risks increased by 0.07, perceptions of domestic nuclear risks decreased by 0.15, perceptions of external nuclear benefits increased by 0.29, and perceptions of domestic nuclear benefits increased by 0.15 on the zero to ten scale of nuclear risks and benefits.

⁴ For lists of component questions and explanations of how our external and domestic nuclear risk and benefit indices were calculated, see Volume I: Chapter Two.

Relationships between political ideology and perceptions of risks and benefits associated with nuclear weapons have been consistently related to three of our risk and benefit indices throughout this project. Over time comparisons are shown in Tables 5.2–5.5.

Table 5.2: Relating Political Ideology to the External Nuclear Risk Index (Bivariate Regressions)

General Public	Intercept	Coefficient (Slope)	t Value	p Value	Adjusted R ²
1999	6.38	.07	2.26	.0241	.01
1997	6.20	.05	1.38	.1666	NA
1995	6.14	.04	1.51	.1309	NA
1993 ⁵	6.04	.09	2.79	.0054	.01

Table 5.3: Relating Political Ideology to the Domestic Nuclear Risk Index (Bivariate Regressions)

General Public	Intercept	Coefficient (Slope)	t Value	p Value	Adjusted R ²
1999	5.93	-.15	-3.97	<.0001	.01
1997	5.65	-.13	-3.46	.0006	.01
1995	7.80	-.25	-7.42	<.0001	.02
1993 ⁶	6.74	-.17	-4.55	<.0001	.02

⁵ In 1993 this index was termed the “nuclear threat index.”

⁶ In 1993 this index was termed the “nuclear weapons management risk index.”

Table 5.4: Relating Political Ideology to the External Nuclear Benefit Index (Bivariate Regressions)

General Public	Intercept	Coefficient (Slope)	t Value	p Value	Adjusted R ²
1999	5.88	.29	9.45	<.0001	.07
1997	5.47	.32	9.39	<.0001	.07
1995	5.74	.28	11.25	<.0001	.05
1993 ⁷	4.96	.36	9.87	<.0001	.05

Table 5.5: Relating Political Ideology to the Domestic Nuclear Benefit Index (Bivariate Regressions)

	Intercept	Coefficient (Slope)	t Value	p Value	Adjusted R ²
1999	6.00	.15	4.07	<.0001	.01
1997	6.11	.10	2.85	.0045	.01
1995	5.55	.23	6.87	<.0001	.02
1993 ⁸	4.39	.14	3.48	.0005	.01

These patterns show that across our four national surveys of the general public, political ideology has been weakly and inconsistently related to perceptions of risks from others' nuclear weapons. However, political ideology has been significantly related in a consistent fashion to perceptions of the risks associated with managing the US nuclear arsenal and with perceptions of external and domestic benefits associated with US nuclear weapons. While the explanatory power of political ideology alone is small, the directions of the relationships and the very low probabilities that the relationships would have occurred by chance are consistent over time. These findings show that

⁷ In 1993 this index was termed the "nuclear utility index," and it did not include the three questions about nuclear deterrence (Q20–22) that were asked in subsequent surveys and included in subsequent calculations of this index.

⁸ In 1993 this index was termed the "domestic benefits index," and did not include the question about the value of technological advances in defense industries for other areas of the US economy (Q35) that was asked in subsequent surveys and included in subsequent calculations of this index.

political beliefs (as measured by self-placement on a left–right ideology scale) were systematically related to perceptions of domestic risks and external and domestic benefits associated with nuclear weapons.

Section 5.3: Relating Ideology to Policy Preferences

TO EXPLORE RELATIONSHIPS BETWEEN POLITICAL IDEOLOGY AND selected nuclear weapons policy and spending preferences, we used our measure of political ideology as the independent variable in a series of bivariate regressions having as the dependent variable responses to questions asking participants to express their views about a range of nuclear weapons policy and spending issues. Results of the separate regressions are summarized in Table 5.6.

Table 5.6: Relationships Between Political Ideology and Selected Policy and Spending Issues: 1999 (Bivariate Regressions)

Issue (Dependent Variable)	Inter- cept	Coeffi- cient	p Value	Adj. R ²
Feasible to eliminate nuclear weapons in next 25 years (Q30: 1 = Strongly Disagree—7 = Strongly Agree)	4.40	-.18	<.0001	.01
Importance of retaining nuclear weapons today (Q32: 0 = Not At All Important—10 = Extremely Important)	5.65	.42	<.0001	.07
Funding to sustain nuclear research infrastructure (Q40: 1 = Substantially Decrease—7 = Substantially Increase)	3.31	.33	<.0001	.07
Degree to which PGMs can replace nuclear weapons for deterrence (Q60: 0 = Not At All—10 = Completely)	5.07	-.21	.0001	.01
Should US build NMD (Q70: 1 = Definitely Should Not—7 = Definitely Should)	4.14	.23	<.0001	.04
Nuclear retaliation against country that used nuclear weapons against the US (Q71: 1 = Strongly Oppose—7 = Strongly Support)	4.51	.24	<.0001	.04

These results show that political ideology was related in statistically significant ways to each of these nuclear weapons policy and spending issues. As political conservatism increased, the perceived importance of retaining nuclear weapons, support for investing in nuclear weapons infrastructure, support for building a system of national missile defenses, and support for nuclear retaliation against a country that had attacked the US with nuclear weapons all increased. And as conservatism increased, agreement decreased with the assertion that it is possible to eliminate all nuclear weapons worldwide in the next twenty-five years and with the degree to which conventionally armed PGMs were thought to be substitutable for nuclear weapons for the purposes of deterrence.

Section 5.4: Relating Other Beliefs About Nuclear Security

POLITICAL IDEOLOGY IS BUT ONE ASPECT OF MULTIDIMENSIONAL BELIEF systems. Variations and shadings of different dimensions of beliefs may be integrated into perceptions and policy preferences about security in rich and subtle ways that are difficult to bring clearly into focus. To help sharpen that focus, in our 1999 survey we presented starkly contrasting statements about multiple dimensions of policy relevant beliefs and asked respondents to indicate with which of the contrasting views they *most* identified. Nine contrasting pairs of statements elicited preferences for a range of beliefs about the security environment, nuclear weapons, and the use of military force. They were designed so that when responses were combined, we could situate participants along a continuum of policy beliefs that could be used as an independent variable to explore structural relationships between beliefs, security perceptions, and policy preferences.

An additional pair of statements contrasted beliefs about the role of the US public in security policy formulation. This pair was included to gain insight about whether participants believed the future of the US nuclear arsenal largely should be determined by security experts and policy elites, or whether respondents preferred for the general public to have a prominent role in future decisions about US nuclear weapons. This pair of statements was not designed to be incorporated into our composite belief index.

To prevent systematic order effect, we randomized the pairs of contrasting statements in two ways: (a) the statements within each pair were read in

random order; and (b) the ten pairs of statements were presented in random sequence. Following is the lead-in to the section.

Lead-in: For the next series, I will read several pairs of opposing statements, and I want you to tell me which statement you agree with the most. It's OK if you do not completely agree with either statement. I just need to know which statement you agree with the *most*.

The pairs of statements and their responses are grouped below by related dimension of beliefs. Each statement also is coded for later use in constructing a composite policy belief index.

Beliefs About Today's Security Environment and Using Force

Three pairs of statements contrasted beliefs about the current security environment, the relative importance of military power, and the use of military force. The statements and response patterns are presented in Tables 5.6–5.8.⁹ Percentages indicate the proportions of respondents who identified *most* with each statement. They should not be interpreted to imply that those proportions agreed fully with either statement.

Table 5.6: Today's Security Environment (Q84)

Lead-in: These statements contrast views about world security today.

	%	Code
a. Today the world is a <i>less</i> dangerous place for the US than it was during the Cold War.	36	0
b. Today the world is a <i>more</i> dangerous place for the US than it was during the Cold War.	64	1

⁹ Question wordings and distributions of responses also are in Volume I: Appendix 3, Q84, Q86, and Q88.

Table 5.7: Importance of Military Power (Q88)

Lead-in: These statements contrast views about US military power.

	%	Code
a. US military power is <i>less</i> important today than it was during the Cold War.	28	0
b. US military power is <i>more</i> important today than it was during the Cold War.	72	1

Table 5.8: Using Military Force (Q86)

Lead-in: These statements contrast views about US foreign policy.

	%	Code
a. Unless it is directly attacked, the US should use military force only when it is authorized by the United Nations.	53	0
b. The US should use military force when the US thinks it's necessary, even if the United Nations does not authorize it.	47	1

Results indicate that almost two-thirds of respondents agreed more with the assessment that the post-Cold War security environment is *more* dangerous for the US than was the environment during the Cold War period. Correspondingly, almost three-fourths of participants were more in agreement with the assertion that US military power is *more* important today than it was during the Cold War. Yet a small majority of respondents agreed more with the statement that, unless attacked, US military force should be used only when authorized by the UN than with the opposite claim that the US should act unilaterally in the use of military force.

Beliefs About the Uses of Nuclear Weapons

The two pairs of statements shown in Tables 5.9 and 5.10 contrast beliefs about the efficacy of nuclear deterrence and about the uses of nuclear weapons.¹⁰

¹⁰ Question wordings and distributions of responses also are in Volume I: Appendix 3, Q81 and Q87.

Table 5.9: Efficacy of Nuclear Deterrence (Q81)

<i>Lead-in: These statements contrast views about nuclear deterrence.</i>	%	Code
a. Nuclear deterrence is dangerous, unstable, and does not prevent war.	40	0
b. Nuclear deterrence is safe, stable, and prevents large conflicts like World Wars I and II.	60	1

Table 5.10: Utility of US Nuclear Weapons (Q87)

<i>Lead-in: These statements contrast views about the uses of nuclear weapons.</i>	%	Code
a. US nuclear weapons have no use except for deterring others from using their nuclear weapons against us.	42	0
b. US nuclear weapons are useful both for deterring others from using their nuclear weapons against us and for winning wars if necessary.	58	1

Sixty percent of respondents were more in agreement with the assertion that nuclear deterrence is safe, stable, and prevents large wars. This is consistent with mean ratings for the efficacy of nuclear deterrence reported in Chapter Three, Section 3.2. When asked to consider contrasting assertions about other uses of US nuclear weapons, 58 percent of respondents agreed more with the statement that nuclear weapons are useful both for deterrence and for winning wars if deterrence fails. Though majorities of respondents were more in agreement with the statements valuing nuclear weapons in each of the two pairs, about four out of every ten respondents disagreed, representing a substantial proportion of opposing sentiment about the utility of nuclear weapons.

Beliefs About the Risks and Benefits of Nuclear Weapons

Two pairs of statements contrasted views about the tradeoffs in risks and benefits of US nuclear weapons and about whether they threaten or protect

key societal values. The statements and proportions of responses are shown in Tables 5.11–5.12.¹¹

Table 5.11: Risks vs. Benefits of the US Nuclear Arsenal (Q82)

<i>Lead-in: These statements contrast views about risks and benefits of the US nuclear arsenal.</i>	%	Code
a. The US nuclear arsenal deters attacks and insures our security, and these <i>benefits</i> far outweigh any <i>risks</i> from US nuclear weapons.	73	1
b. The US nuclear arsenal threatens civilization and cannot be safely managed, and these <i>risks</i> far outweigh any <i>benefits</i> from US nuclear weapons.	27	0

Table 5.12: Nuclear Weapons and US Values (Q83)

<i>Lead-in: These statements contrast views about US nuclear weapons and personal values.</i>	%	Code
a. US nuclear weapons <i>threaten</i> institutions that support freedom, self-determination, and human rights.	28	0
b. US nuclear weapons <i>protect</i> institutions that support freedom, self-determination, and human rights.	72	1

For both pairs, over 70 percent of respondents agreed more with the statements asserting that the benefits of US nuclear weapons outweigh the risks associated with them, and that US nuclear weapons protect key values more than they threaten them.

Beliefs About Eliminating Nuclear Weapons

The issue of eliminating nuclear weapons has two related but different dimensions. One has to do with the *desirability* of eliminating nuclear weapons. Views about this dimension are likely to reflect ideological or philosophical preferences for how the world *should* be. The other dimension has to

¹¹ Question wordings and distributions of responses also are shown in Volume I: Appendix 3, Q82–83.

do with the *feasibility* of eliminating nuclear weapons. Views about this dimension are likely to reflect expectations about how the world *will* be. We crafted two pairs of contrasting statements to gain insight about both dimensions of views. The statements and percentages of respondents who most identified with each are shown in Tables 5.13–5.14.

Table 5.13: Desirability of Eliminating All Nuclear Weapons (Q80)

Lead-in: These statements contrast views about the desirability of a world without nuclear weapons.

	%	Code
a. If all nuclear weapons were eliminated, the world would be safer, because wars would be less likely to destroy civilization.	69	0
b. If all nuclear weapons were eliminated, the world would be more dangerous, because large conflicts like World Wars I and II would be more likely.	31	1

Table 5.14: Feasibility of Eliminating All Nuclear Weapons (Q85)

Lead-in: These statements contrast views about eliminating nuclear weapons worldwide.

	%	Code
a. Eliminating all nuclear weapons worldwide can be achieved if the US sets the example and uses its influence to persuade other countries.	16	0
b. Eliminating all nuclear weapons worldwide cannot be achieved, because knowledge about them is too widespread, and the US cannot prevent others from acquiring them.	84	1

Though more than two out of three respondents agreed that a world without nuclear weapons would be safer, more than eight out of ten participants considered the elimination of all nuclear weapons worldwide to be unachievable. These results are consistent with more impressionistic findings from our focus groups reported in Appendix 2 of this volume and with responses since 1993 to related survey questions reported in Chapter Three, Tables 3.1–3.2.

Role of the Public in Nuclear Security Policy

Our final pair of statements in this series did not pertain to perceptions about security issues or valuations of nuclear weapons. This pair of statements contrasted views about the role that respondents thought the American public should have in evolving nuclear security policies. Statements and responses are shown in Table 5.15.

Table 5.15: Role of the Public in Nuclear Policy (Q89)

<i>Lead-in: These statements contrast views about the role of the public in determining the future of US nuclear weapons.</i>	<i>%</i>
a. The debate about the future of the US nuclear arsenal should be left primarily to experts and elected officials in the US Congress.	35
b. The debate about the future of the US nuclear arsenal should be open equally to everyone, including the media, citizen groups, and individual citizens.	65

Only about one-third of respondents agreed more with the elitist or technocratic assertion that the debate about nuclear weapons should be left primarily in the hands of experts and elected officials. The other two-thirds agreed more with the populist statement that the debate should include the public at large, the media, and citizen groups.

Section 5.5: Creating a Composite Policy Belief Index

THE FIRST NINE PAIRS OF ABOVE STATEMENTS REFLECT PARTICIPANTS' affinity for starkly contrasting beliefs about related dimensions of today's security environment and the role of nuclear weapons. They were designed so that when combined, they represent a continuum of policy beliefs that we hypothesized to be systematically related to perceptions and preferences about nuclear security. The last pair of statements contrasted beliefs about whether the security policy *process* ought to incorporate active public participation. It was intended as a stand-alone compliment to the other nine pairs of statements, and we did not include it in the composite belief index discussed below.

We constructed our index by assigning a code of either zero or one to the contrasting beliefs expressed in each of the first nine pairs of statements shown above. Then we calculated a composite score for each respondent by summing the codes for the nine component statements with which the respondent most agreed.¹² In so doing, we created a ten point linear scale with values from zero to nine for each participant. A score of *zero* indicates affinity for each of the following statements:

- Today the world is a *less* dangerous place for the US than it was during the Cold War.
- US military power is *less* important today than it was during the Cold War.
- Unless it is directly attacked, the US should use military force only when it is authorized by the United Nations.
- Nuclear deterrence is dangerous, unstable, and does not prevent war.
- US nuclear weapons have no use except for deterring others from using their nuclear weapons against us.
- The US nuclear arsenal threatens civilization and cannot be safely managed, and these *risks* far outweigh any *benefits* from US nuclear weapons.
- US nuclear weapons *threaten* institutions that support freedom, self-determination, and human rights.
- If all nuclear weapons were eliminated, the world would be safer, because wars would be less likely to destroy civilization.
- Eliminating all nuclear weapons worldwide can be achieved if the US sets the example and uses its influence to persuade other countries.

A score of *nine* indicates an affinity for each of the following statements:

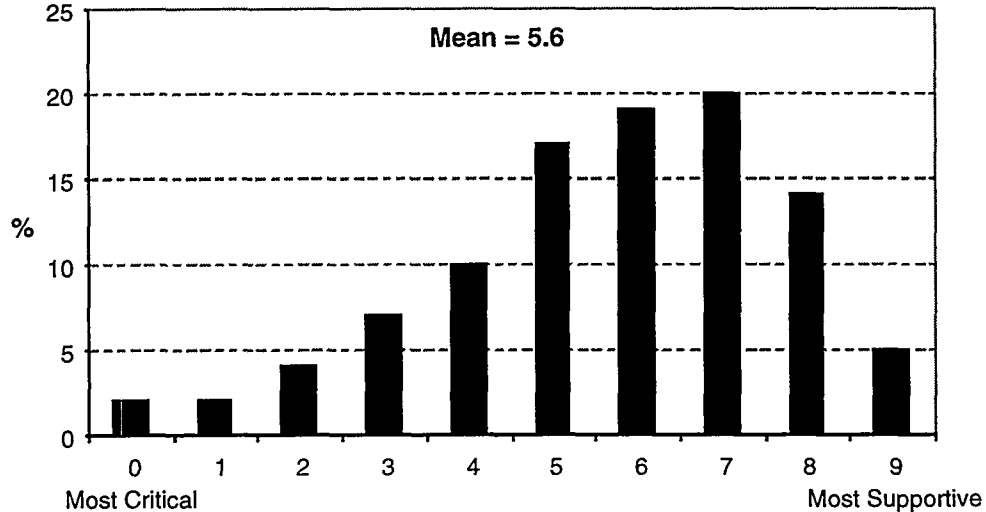
- Today the world is a *more* dangerous place for the US than it was during the Cold War.
- US military power is *more* important today than it was during the Cold War.
- The US should use military force when the US thinks it's necessary, even if the United Nations does not authorize it.
- Nuclear deterrence is safe, stable, and prevents large conflicts like World Wars I and II.
- US nuclear weapons are useful both for deterring others from using their nuclear weapons against us and for winning wars if necessary.

¹² Cases having missing values for any of the nine component pairs of statements were omitted.

- The US nuclear arsenal deters attacks and insures our security, and these *benefits* far outweigh any *risks* from US nuclear weapons.
- US nuclear weapons *protect* institutions that support freedom, self-determination, and human rights.
- If all nuclear weapons were eliminated, the world would be more dangerous, because large conflicts like World Wars I and II would be more likely.
- Eliminating all nuclear weapons worldwide cannot be achieved, because knowledge about them is too widespread, and the US cannot prevent others from acquiring them.

Together, these descriptions define the end points of our policy belief index. At one end, zero represents views that are most *critical* of traditional and establishmentarian beliefs about nuclear security. At the opposite end, nine represents views that are most *supportive* of traditional and establishmentarian beliefs about nuclear security. Individual scores can range anywhere along the scale between the end points, and the distribution of scores and the mean value for all participants is shown in Figure 5.2.

Figure 5.2: Policy Belief Index (Q80–88)¹³



The pattern of responses is smooth and approximates a normal distribution with a skew to the left, and the mean of 5.6 is well above the midpoint of 4.5. Only 2 percent of respondents scored zero and only 5 percent scored nine. Seventy-five

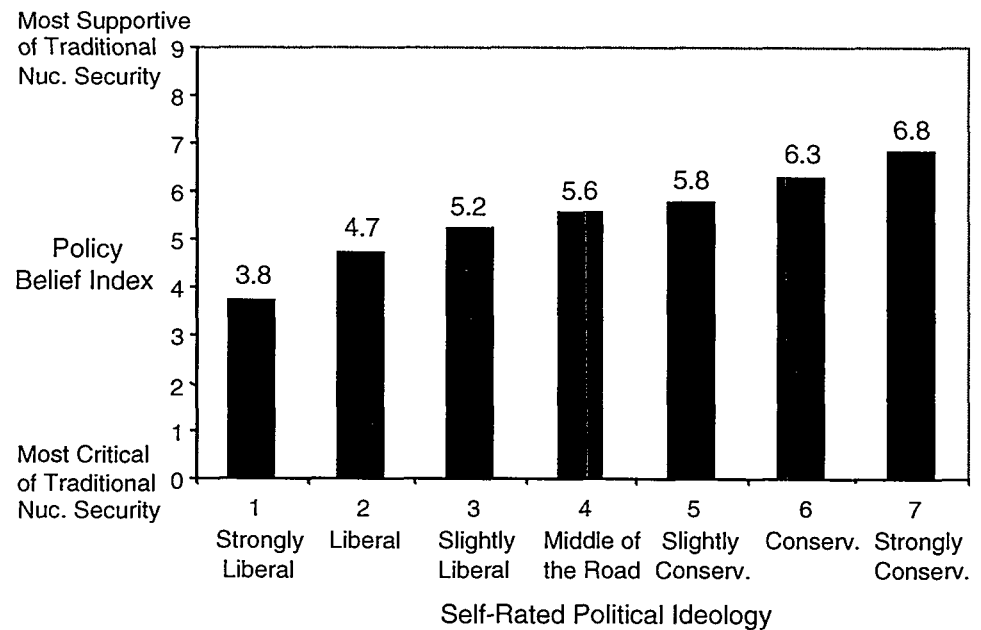
¹³ The policy belief index was created by summing responses to Q80–88. Cases with missing values for any of the component questions were excluded.

percent of respondents were above the midpoint, and 25 percent were below. The modal response value was seven, scored by 20 percent of respondents.

Comparing Political Ideology to the Policy Belief Index

To examine the relationships between self-rated political ideology, expressed on a left–right continuum, and our composite measures of different dimensions of policy relevant beliefs about nuclear security, we plotted the policy belief index score for each of the seven points along the scale of political ideology discussed in Section 5.1. Because our policy belief index reflects the degree to which respondents identified with beliefs associated with traditional and establishmentarian views of nuclear security, we expected to find that policy belief index scores increased with the degree of self-rated political conservatism. As shown in Figure 5.3, the expected relationships were found.

Figure 5.3: Relating Policy Beliefs with Political Ideology: 1999



Section 5.6: Relating Policy Beliefs and Risk/Benefit Perceptions

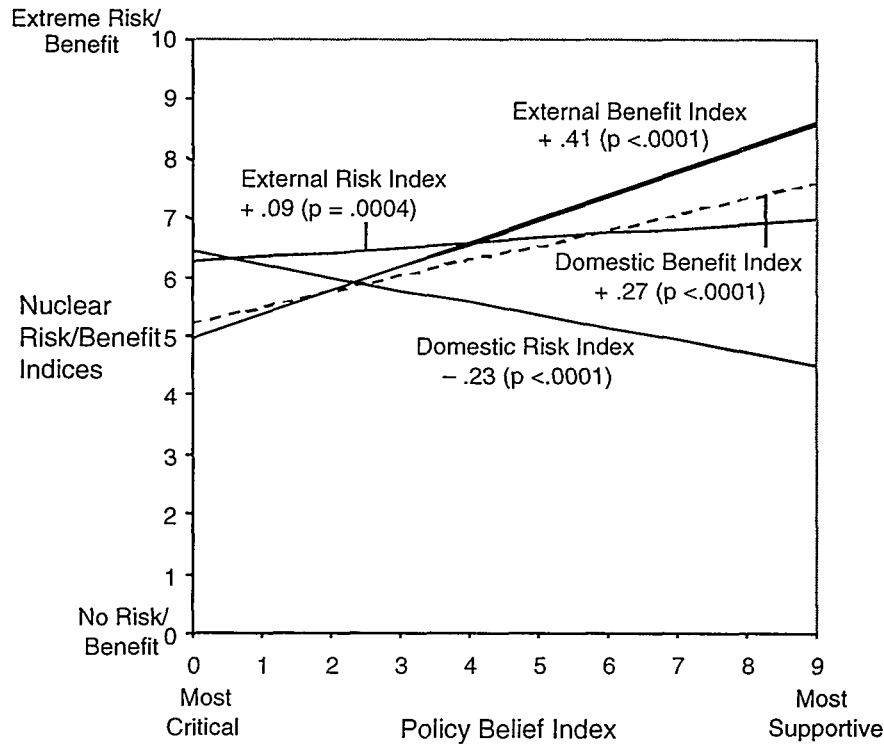
RELATIONSHIPS AMONG BELIEFS AND PERCEPTIONS OFTEN ARE INTRICATE, because it is not always possible to determine which precedes the other. Do beliefs help shape the ways in which we perceive nuclear risks and benefits? Do our perceptions of nuclear risks and benefits help shape our beliefs about the context in which nuclear policy issues are decided? We hypothesized that relationships between perceptions of nuclear risks and benefits and beliefs about policy context are interactive, and that influence is bidirectional in some cases.

To further examine these relationships, we first used our policy belief index as the independent variable in separate bivariate regressions to explain each of our four external and domestic nuclear risk and benefit indices. Results are shown in Table 5.16 and graphed in Figure 5.4. Then we used our four nuclear risk and benefit indices as independent variables in a multiple regression to predict scores on the policy belief index. Results are summarized in Table 5.17.

Table 5.16: Using the Policy Belief Index to Explain the Nuclear Risk and Benefit Indices: 1999 (Bivariate Regressions)

Dependent Variable	Intercept	Coefficient (Slope)	t Value	p Value	Adj. R ²
External Risk Index	6.17	.09	3.55	.0004	.01
Domestic Risk Index	6.56	-.23	-7.45	<.0001	.05
External Benefit Index	4.85	.41	17.60	<.0001	.23
Domestic Benefit Index	5.15	.27	9.32	<.0001	.08

Figure 5.4: Graphing Results of Using Policy Beliefs to Explain Perceptions of Nuclear Risks and Benefits (Bivariate Regressions)



These results show that when used as the independent variable in separate bivariate regressions, our policy belief index systematically explained variation in our nuclear risk and benefit indices. For each one point increase on the policy belief index (increasing support of traditional establishmentarian beliefs about nuclear security), perceptions of the risks from others' nuclear weapons increased 0.09, perceptions of risks from our own nuclear arsenal decreased 0.23, perceptions of the external benefits of our own nuclear weapons increased 0.41, and perceptions of the domestic benefits of US nuclear weapons increased 0.27. As was the case with political ideology in Section 5.1, the most powerful relationship was between policy beliefs and perceptions of the external benefits of US nuclear weapons.

The consistency in the direction of relationships and in the coefficients of relationships between political ideology and our policy belief index for predicting perceptions of nuclear weapons risks and benefits is mutually reinforcing, and it indicates that participants were integrating and approximating

multiple dimensions of beliefs when they characterized their political beliefs on a left–right ideology continuum. It also implies that our policy belief index is combining relevant dimensions of beliefs about nuclear security.

Table 5.17: Using the Composite Risk and Benefit Indices to Explain the Policy Belief Index: 1999 (Multiple Regressions)

Independent Variables	Coefficient (Slope)	t Value	p Value
	Intercept = 1.89	R ² = .30	
External Risk Index	.12	3.32	.0009
Domestic Risk Index	-.26	-9.09	<.0001
External Benefit Index	.48	14.20	<.0001
Domestic Benefit Index	.13	4.56	<.0001

As shown in Table 5.17, when our four nuclear risk and benefit indices were used as independent variables in a multivariate regression they explained about 30 percent of the variation in the policy belief index (dependent variable). As perceptions of external nuclear risks increased one point (with the other three indices being held constant), the policy belief index score increased 0.12. As perceptions of domestic nuclear risks increased one point, the policy belief index score decreased 0.26. Both nuclear benefit indices were positively related to the policy belief index. A one point increase in perceptions of external benefits resulting in a corresponding increase of 0.48 in the policy belief index score, and for each point increase in perceptions of domestic benefits, the policy belief index score increased by 0.13.

These relationships show that perceptions of nuclear weapons risks and benefits and beliefs about those dimensions of the nuclear security policy context that we measured were interactively linked.

Section 5.7: Relating Policy Beliefs to Policy Preferences

TO EXAMINE HOW OUR POLICY BELIEF INDEX WAS RELATED TO KEY POLICY and spending issues, we used the belief index as the independent variable in separate bivariate regressions to explain the same set of six key policy variables that we used in Section 5.1 where political ideology was the explanatory variable. Similar findings are shown in Table 5.18.

Table 5.18: Relationships Between the Policy Belief Index and Selected Policy and Spending Issues: 1999 (Bivariate Regressions)

Issue (Dependent Variable)	Inter- cept	Coeffi- cient	p Value	Adj. R ²
Feasible to eliminate nuclear weapons in next 25 years (Q30: 1 = Strongly Disagree—7 = Strongly Agree)	5.99	-.42	<.0001	.13
Importance of retaining nuclear weapons today (Q32: 0 = Not At All Important—10 = Extremely Important)	4.25	.57	<.0001	.21
Funding to sustain nuclear research infrastructure (Q40: 1 = Substantially Decrease—7 = Substantially Increase)	2.61	.39	<.0001	.17
Degree to which PGMs can replace nuclear weapons for deterrence (Q60: 0 = Not At All—10 = Completely)	6.02	-.33	<.0001	.05
Should US build NMD (Q70: 1 = Definitely Should Not—7 = Definitely Should)	3.66	.27	<.0001	.09
Nuclear retaliation against country that used nuclear weapons against the US (Q71: 1 = Strongly Oppose—7 = Strongly Support)	3.60	.35	<.0001	.14

Results show that our policy belief index is an even more reliable predictor of policy and spending preferences than is political ideology. Both measures of beliefs share the same directional relationships, but for each issue, our policy belief index produced larger coefficients (steeper slopes) and greater explanatory power than did political ideology.¹⁴

¹⁴ For direct comparisons, contrast Tables 5.6 and 5.18.

As values increased on our policy belief index (increasing concurrence with traditional and establishmentarian beliefs about nuclear security), the importance of retaining nuclear weapons, support for funding nuclear weapons infrastructure, support for building national missile defenses, and support for nuclear retaliation against a country that used nuclear weapons against the US increased. And as values on the policy belief index increased, concurrence with the assertion that it is feasible to eliminate all nuclear weapons worldwide within the next twenty-five years and the degree to which respondents thought conventionally armed PGMs could replace nuclear weapons for purposes of deterrence decreased.

Section 5.8: Summarizing Implications of Belief Systems for Nuclear Security

Political Beliefs

THE CONSISTENCY WITH WHICH RESPONDENTS IN FOUR NATIONAL surveys over a six- year period were able to characterize their political beliefs on a left–right continuum indicates that self-rated political ideology remains a reliable indicator of overall political orientation. And the consistency with which self-rated political ideology has been related to perceptions of risks and benefits associated with nuclear weapons indicates a systematic positive relationship between increasing political conservatism and perceptions of external and domestic benefits thought to derive from the US nuclear arsenal, and a negative relationship between increasing conservatism and perceptions of the domestic risks associated with US nuclear weapons. Though the relationship between political ideology and perceptions of the risks from others’ nuclear weapons (external risks) was statistically significant in 1999 and 1993, it was not significant in 1995 and 1997, and political ideology does not appear to be a reliable predictor of external nuclear risk perceptions.

In 1999, political ideology was again found to be systematically related to security policy and spending preferences. As political conservatism increased, assessments of the importance of retaining nuclear weapons, support for increasing funding for nuclear weapons infrastructure, support for a national missile defense system, and support for nuclear retaliation against a country that attacked the US with nuclear weapons all increased. And as

conservatism increased, agreement that it is feasible to eliminate all nuclear weapons within the next twenty-five years, and agreement that PGMs can replace nuclear weapons for purposes of deterrence decreased.

Policy Beliefs

Our policy belief index, composed of respondents' reactions to nine pairs of contrasting assertions about the security environment, nuclear weapons, and the use of force, proved to be an even more powerful predictor of perceptions and preferences than political ideology. As respondents' support for traditional and establishmentarian beliefs about nuclear security increased, so too did their rating of the importance of retaining nuclear weapons and their support of funding for nuclear weapons infrastructure, NMD, and nuclear retaliation. Affinity for traditionalist beliefs was negatively associated with the assertion that it is feasible to eliminate all nuclear weapons in the next twenty-five years and with the degree to which PGMs were thought to have potential for replacing nuclear weapons for purposes of deterrence. These predictable relationships between views of multidimensional aspects of nuclear security and perceptions and policy preferences lend further evidence to the systematic connections among members of the general public between beliefs, perceptions, and preferences about nuclear security policies.

We also illustrated how perceptions of risks and benefits associated with nuclear weapons are interactively related with policy relevant beliefs about the security environment and the context for evolving nuclear security policy.

Role of the Public in Debates About Security Policy

Reactions to a pair of contrasting statements about the degree to which debates about the future of the US nuclear arsenal should involve mass publics indicated a clear preference by two-thirds of respondents for open public participation. This reinforces the more impressionistic indications of beliefs among focus group participants reported in Volume I: Appendix 2. These and other indicators lead us to conclude that most members of the general public want opportunities to participate in the evolution of post-Cold War security policy.

Volume I: Chapter Six

Demographics and Nuclear Security

FINDINGS FROM PREVIOUS PHASES OF THIS PROJECT HAVE SHOWN THAT some demographic characteristics are related importantly both to perceptions and policy preferences about nuclear security issues. This chapter examines how respondent age, gender, education, and income were related to external and domestic nuclear risk perceptions, external and domestic nuclear benefit perceptions, and key policy and spending preferences.

Section 6.1: Relating Age and Nuclear Security

IN OUR 1999 SURVEY, RESPONDENTS RANGED IN AGES FROM 18 TO 98. The mean was 44.1 years of age. In Table 6.1 we show the percent of respondents in each of six age groups.

Table 6.1: Distribution of Respondents by Age Group: 1999

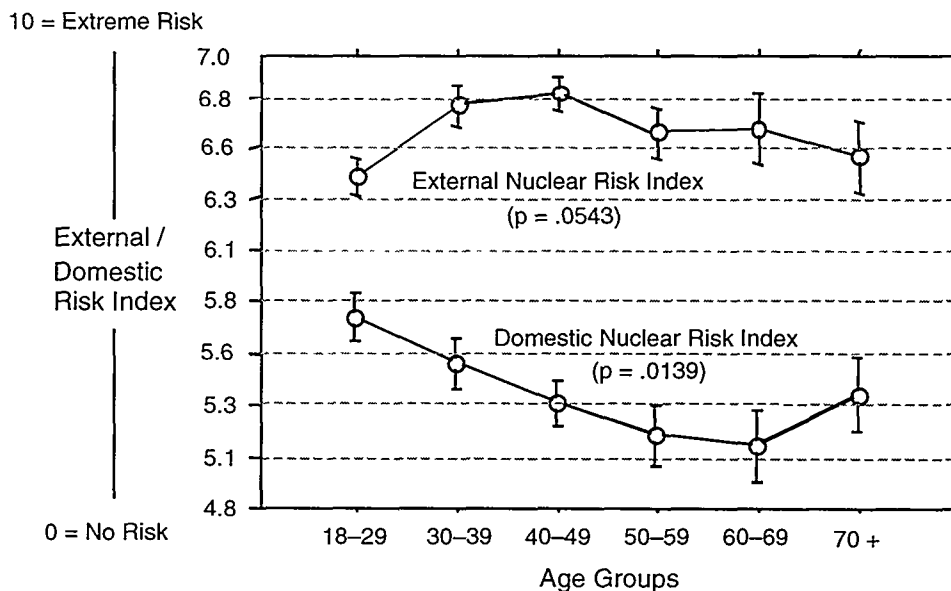
Ages (%)	18–29	30–39	40–49	50–59	60–69	70 +
1999	22	20	25	14	10	9

Age and Perceptions of Nuclear Risks and Benefits

Figure 6.1 shows mean perceptions of our external and domestic nuclear risk indices (with 95 percent confidence bars) by age group.¹

¹ For a list of component questions and explanation of how the external and domestic nuclear risk indices were calculated, see Volume I :Chapter Two.

Figure 6.1: Mean Perceptions of the External and Domestic Nuclear Risk Indices by Age Group: 1999

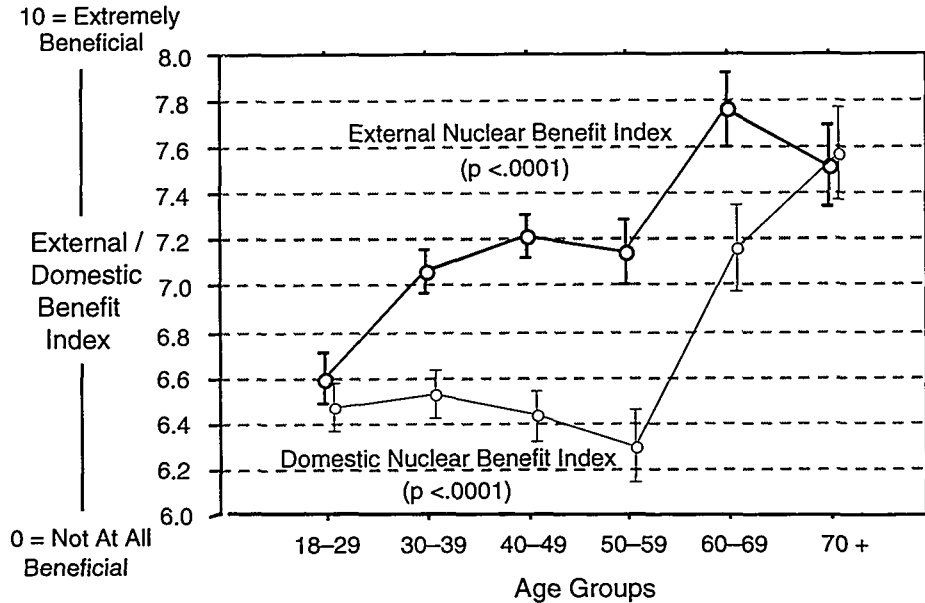


Perceptions of *external* nuclear risks to the US (risks from other countries' nuclear weapons) were lowest, and perceptions of *domestic* nuclear risks to the US (risks from managing our own nuclear arsenal) were highest among respondents in the youngest age group. Perceptions of external risks increased for the next two age groups, reaching the highest level among those 40–49 years of age before declining slightly with further increases in age. Perceptions of domestic risks decreased with each succeeding age group until reaching those 70 years of age and above. Analysis of variance (ANOVA) showed that overall variations in domestic risk perceptions by age group were statistically significant. Though overall variations in perceptions of external risks did not quite meet statistical significance at the 95 percent confidence level ($p = .0543$), they warrant notice.

Figure 6.2 compares mean perceptions of our external and domestic nuclear benefit indices by age group.²

² For a list of component questions and explanation of how the external and domestic nuclear benefit indices were calculated, see Volume I: Chapter Two.

Figure 6.2: Mean Perceptions of the External and Domestic Nuclear Benefit Indices by Age Group: 1999



These patterns show that perceptions of *external* benefits associated with US nuclear weapons tended to increase with age, though there was a slight decline among the 50–59 age group and a drop off at ages 70 and above. Perceptions of *domestic* benefits associated with US nuclear weapons tended to decline between ages 30 and 60, then valuations of domestic benefits increased sharply. Overall variations in both external and domestic benefit perceptions by age group were highly significant ($p < .0001$).

When age was used as a continuous independent variable in separate bivariate regressions to predict our nuclear weapons risk and benefit indices, systematic relationships were found between age and perceptions of external and domestic nuclear benefits and between age and perceptions of domestic nuclear risks. Age was not predictably related to perceptions of external nuclear risks. Results are summarized in Table 6.2.

Table 6.2: Using Age to Predict Perceptions of Nuclear Weapons Risks and Benefits

Dependent Variable	Intercept	Coefficient (Slope)	t Value	p Value	Adj. R ²
External Risk Index	6.62	N/A	0.23	.8192	NA
Domestic Risk Index	5.87	-.01	-3.41	.0007	.01
External Benefit Index	6.32	.02	6.05	<.0001	.03
Domestic Benefit Index	5.92	.02	4.54	<.0001	.01

Results indicate that as age increased one year, perceptions of domestic nuclear risks decreased 0.01, and perceptions of external and domestic nuclear benefits each increased 0.02.

The influence of age on perceptions of nuclear risks and benefits and differences among age groups could be an effect of individual aging—getting older may cause one to view the risks and benefits of nuclear weapons differently. Another explanation could be cohort effect in which shared experiences of different age groups may have shaped members' views of nuclear risks and benefits.

Age and Valuations of Nuclear Deterrence

One of the potentially most important implications of cohort effect for future nuclear security policy is whether having experienced the Cold War created cohort effects that are different from those among groups of Americans who did not personally experience the Cold War as adults. One possibility is that having experienced the nuclear standoff of the Cold War may have influenced one's assessment of the deterrent value of nuclear weapons. If true, this could mean that as larger proportions of the US public who did not experience the nuclear tensions of the Cold War reach maturity, the perceived value of nuclear deterrence may change as a function of shared experiences or the lack of shared experiences. If such a change occurs, it could have important implications for debate about future security policies. The key question is whether the Cold War experience uniquely shaped views about nuclear deterrence, and if so, what influence it exerted.

To examine the possible implications of cohort effect for the valuation of nuclear deterrence, we examined four questions dealing most directly with nuclear deterrence.³

- Using a scale where zero is *not at all important*, and ten is *extremely important*, how important was nuclear deterrence in preventing nuclear conflict during the Cold War? (Q20)
- Using the same zero to ten scale, how important are US nuclear weapons for preventing other countries from using nuclear weapons against us today? (Q21)
- For this question, zero means *not at all effective*, and ten means *extremely effective*. If more countries acquire nuclear weapons in the future, how effective will nuclear deterrence be in preventing nuclear wars from occurring anywhere in the world? (Q22)
- Using a scale where zero means *not at all important*, and ten means *extremely important*, how important are US nuclear weapons for preventing other countries from using chemical or biological weapons against us today? (Q23)⁴

Results of cohort analysis of age groups are graphed in Figures 6.3–6.6, and results of bivariate regressions using age as a continuous independent variable to explain responses to each of the questions are summarized in Table 6.3.

³ Response patterns and trends to these questions are discussed in Volume I: Chapter Three. Lead-ins, question wordings, and distributions of responses are in Volume I: Appendix 3, Q20–23.

⁴ Question 23 was added in 1999; responses cannot be compared to previous surveys.

Figure 6.3: Mean Importance of Nuclear Deterrence for Preventing Nuclear Conflict During the Cold War (by Age Group): 1999 (Q20)

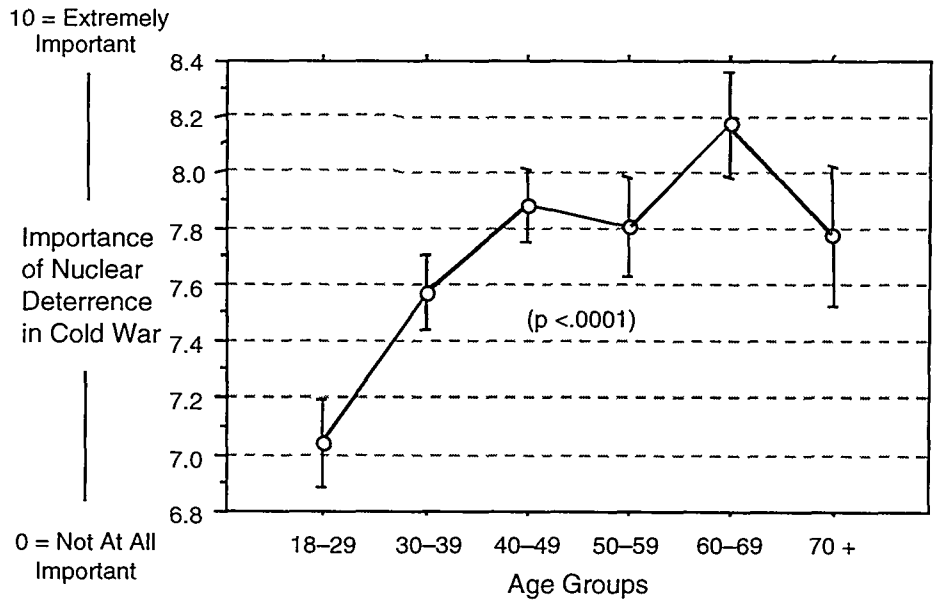


Figure 6.4: Mean Importance of Nuclear Deterrence for Preventing Nuclear Conflict Today (by Age Group): 1999 (Q21)

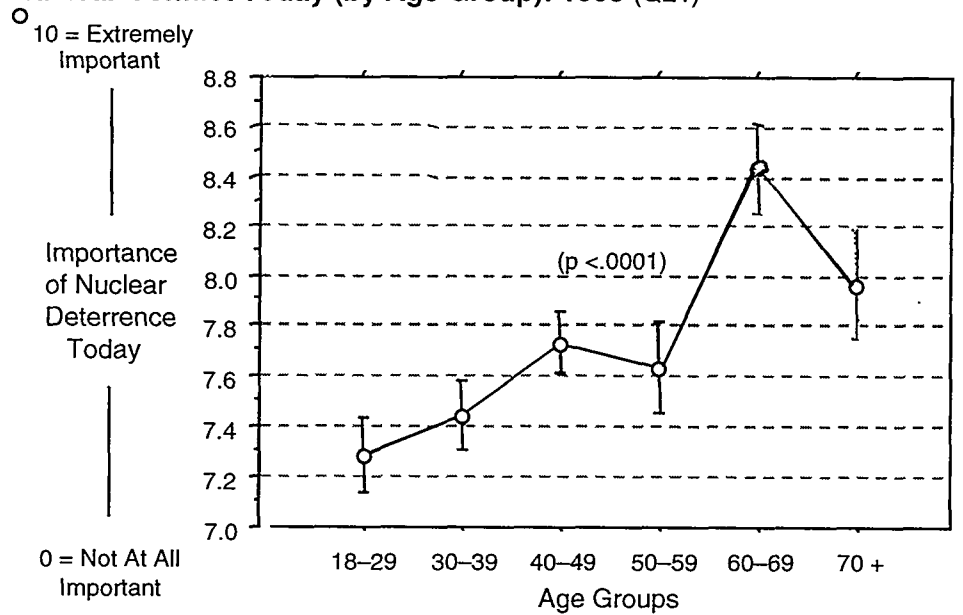


Figure 6.5: Mean Future Effectiveness of Nuclear Deterrence for Preventing Nuclear Conflict (by Age Group): 1999 (Q22)

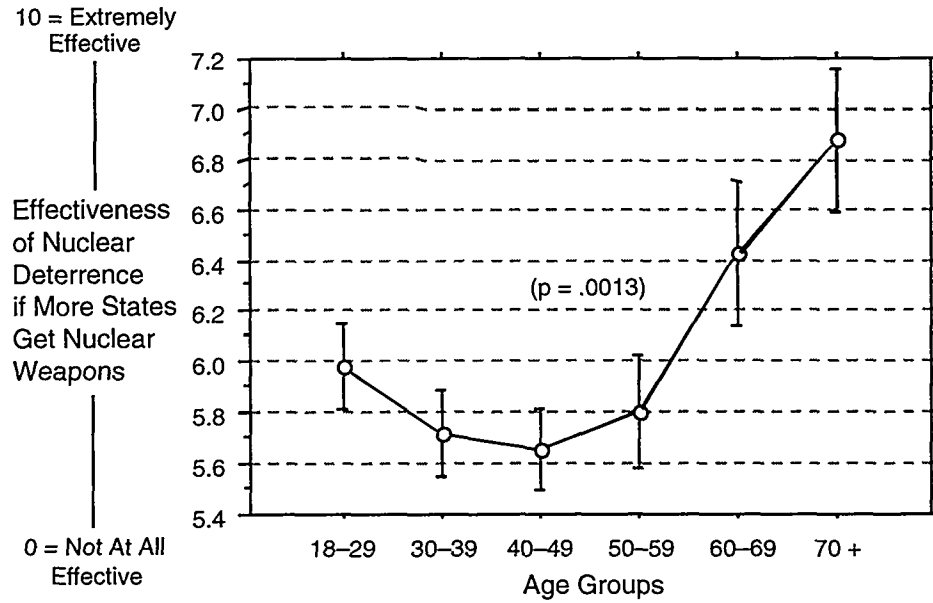
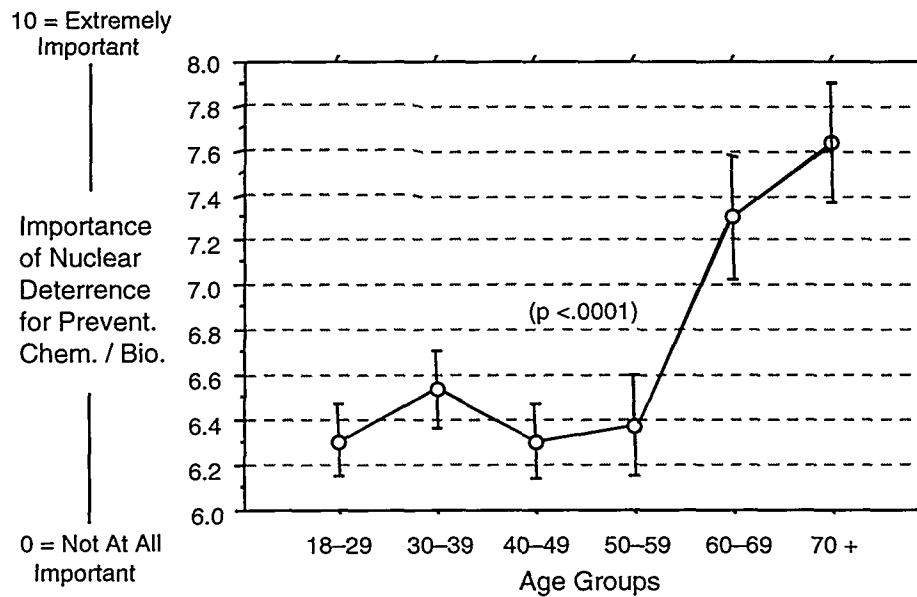


Figure 6.6: Mean Importance of Nuclear Deterrence for Preventing Chemical and Biological Attacks (by Age Group): 1999 (Q23)



Overall differences among age groups were statistically significant for responses to each of the four nuclear deterrence questions. Mean perceptions of the value of nuclear deterrence for preventing nuclear conflict during the Cold War and today tended to increase with increasing age groups except for those 70 years of age and older. Mean estimates of the effectiveness of nuclear deterrence in preventing nuclear conflict anywhere in the world if more countries acquire nuclear weapons initially decreased from ages 18–29 to 40–49, then sharply increased for higher age groups. Mean perceptions of the current importance of nuclear deterrence for preventing other countries from using chemical or biological weapons against the US generally trended upward with increasing age.

Next we used individual ages as a continuous independent variable in bivariate regressions to predict responses to each of the four deterrence questions (Q20–23). Results are summarized in Table 6.3.

Table 6.3: Relating Age to Valuations of Nuclear Deterrence: 1999

Dependent Variable in Bivariate Regressions	Intercept	Coefficient	p Value	Adj. R ²
Importance of nuclear deterrence in preventing nuclear conflict during Cold War (Q20: 0 = Not At All Important—10 = Extremely Important)	6.93	.02	<.0001	.01
Importance of nuclear deterrence for preventing nuclear conflict today (Q21: 0 = Not At All Important—10 = Extremely Important)	6.92	.02	<.0001	.01
Effectiveness of nuclear deterrence for preventing nuclear conflict if more countries acquire nuclear weapons (Q22: 0 = Not At All Effective—10 = Extremely Effective)	5.30	.01	.0039	.01
Importance of nuclear deterrence for preventing countries from using chemical or biological weapons against the US today (Q23: 0 = Not At All Important—10 = Extremely Important)	5.72	.02	.0001	.01

In each case, age was systematically related to the valuation of nuclear deterrence, but the coefficients were small, and age alone did not explain much of the variation in the dependent variables.

Using the first three of our deterrence valuation questions that were included in our 1995, 1997, and 1999 surveys, we performed additional tests to examine how respondents who had reached the age of 18 since the end of the Cold War valued nuclear deterrence. Individuals who were ages 18–21 in 1995 (the first year these questions were asked) were ages 14–17 in 1991 when the Soviet Union was dissolved and the Cold War ended. Those who were ages 18–21 in 1999 (the most recent year these questions were asked) were ages 10–13 when the Cold War ended. First, we compared mean valuations of nuclear deterrence among those 18–21 years of age in 1995 with those of the same ages in 1999 and found that differences in means for each of the three deterrence questions were not statistically significant. Then we compared those who were 18–21 years of age in 1995 with members of their cohort group who were 22–25 years of age by 1999. Again we found that differences in means for responses to each of the three deterrence questions asked in both survey years were not significant.

Our findings show systematic relationships between age and valuation of nuclear deterrence in the past and present and for future projections. In general, perceptions of the value of nuclear deterrence increased with age until about the age of 70, after which some measures declined. Though the relationship of age to perceptions of the value of nuclear deterrence was statistically significant, age alone provided only modest explanation of the variation in deterrence value. About a decade has passed since the end of the Cold War, and more time may be needed to see implications for deterrence valuation among cohort groups, but thus far we have found no evidence that not having experienced the Cold War as an adult is systematically related to changes in value attributed to nuclear deterrence.

Age and Security Policy Preferences

Our final analysis in this section uses bivariate regressions to examine relationships between age, as the continuous independent variable, and the same six policy issues used in Chapter Five. Results are summarized in Table 6.4.

Table 6.4: Relating Age to Security Policy Preferences: 1999

Dependent Variable in Bivariate Regressions	Intercept	Coefficient	p Value	Adj. R ²
Feasible to eliminate nuclear weapons in next 25 years (Q30: 1 = Strongly Disagree—7 = Strongly Agree)	3.89	-.01	.1683	N/A
Importance of retaining nuclear weapons today (Q32: 0 = Not At All Important—10 = Extremely Important)	6.26	.03	<.0001	.03
Funding to sustain nuclear research infrastructure (Q40: 1 = Substantially Decrease—7 = Substantially Increase)	3.78	.02	<.0001	.03
Degree to which PGMs can replace nuclear weapons for deterrence (Q60: 0 = Not At All—10 = Completely)	4.73	-.01	.0173	<.01
Should US build NMD (Q70: 1 = Definitely Should Not—7 = Definitely Should)	5.01	<.01	.3732	N/A
Nuclear retaliation against country that used nuclear weapons against the US (Q71: 1 = Strongly Oppose—7 = Strongly Support)	5.11	.01	.0050	.01

These results show that age was not significantly related to agreement with the assertion that it is feasible to eliminate all nuclear weapons worldwide within the next twenty-five years, or with the question of whether the US should build national missile defenses. But for each additional year of age, perceived importance of retaining nuclear weapons increased 0.03; support for increasing funding to maintain the ability to develop and improve US nuclear weapons in the future increased 0.02; perceptions of the degree to which conventionally armed PGMs can replace nuclear weapons for purposes of deterrence decreased 0.01; and support for nuclear retaliation against a country that used nuclear weapons against the US increased 0.01. Though these coefficients are small in absolute terms, they reflect changes in the dependent variables associated with an increase of only one year of age, and considering that respondent ages ranged from 18 to 98 years, changes in dependent variables over the entire eighty-point scale of the independent variable are substantial.

Section 6.2: Relating Gender and Nuclear Security

FIFTY-SIX PERCENT OF RESPONDENTS IN 1999 WERE WOMEN, AND 44 percent were men. In previous phases of this project we reported significant differences in the ways in which women and men perceived some of the risks and benefits associated with nuclear weapons and in their respective preferences for some security policy options. Those distinctions that have been most persistent over time imply predictable attributes associated with gender differences that may be relevant to nuclear security policy considerations.

Gender and Perceptions of Nuclear Weapons Risks and Benefits

Mean values for the external and domestic risk indices among women and men are compared in Tables 6.5 and 6.6.⁵

Table 6.5: Mean External Nuclear Risk Index by Gender: 1993–1999

Mean External Nuclear Risk Index	1999	1997	1995	1993
Women	6.8	6.5	6.4	6.6
Men	6.5	6.2	6.3	6.3
Difference	-0.3	-0.3	-0.1	-0.2
p-value	.0041	.0020	.1004	.0003

Table 6.6: Mean Domestic Nuclear Risk Index by Gender: 1993–1999

Mean Domestic Nuclear Risk Index	1999	1997	1995	1993
Women	5.9	5.7	6.4	6.7
Men	4.7	4.5	4.9	5.4
Difference	-1.2	-1.2	-1.5	-1.3
p-value	<.0001	<.0001	<.0001	<.0001

⁵ For lists of component questions and explanations of how the external and domestic nuclear risk indices were calculated, see Volume I, Chapter Two.

These patterns reflect systematic differences in the ways in which women and men perceived the risks associated with others' nuclear weapons and the risks associated with our own nuclear arsenal. In each of our four general public surveys since 1993, women rated both external and domestic nuclear weapons risks higher than men. Gender-based differences in perceptions of external nuclear risks were sufficiently large to reach statistical significance in each survey except for 1995. Gender differences in perceptions of domestic nuclear risks were much larger, and were highly statistically significant in each of our surveys.⁶

Though men tended to perceive slightly greater benefits from nuclear weapons than did women, gender-based differences in mean perceptions of the external and domestic nuclear benefit indices were not statistically significant in any of our four surveys of the general public.

Gender and Security Policy Preferences

Using responses to the same six questions about security policy issues previously used, we compare mean responses of women and men in Table 6.7.

⁶ Gender-based differences in domestic nuclear risk perceptions also were found at similar levels among three different groups of scientists and among state legislators from all fifty states. See Herron and Jenkins-Smith, 1998, Chapter Five, Section 5.2 for specifics.

Table 6.7: Relating Gender to Security Policy Preferences: 1999

Issue	Women (Means)	Men (Means)	Diff.	p Value
Feasible to eliminate nuclear weapons in next 25 years (Q30: 1 = Strongly Disagree—7 = Strongly Agree)	3.8	3.4	-.4	.0107
Importance of retaining nuclear weapons today (Q32: 0 = Not At All Important—10 = Extremely Important)	7.4	7.7	+.3	.0134
Funding to sustain nuclear research infrastructure (Q40: 1 = Substantially Decrease—7 = Substantially Increase)	4.7	4.8	+.1	.4492
Degree to which PGMs can replace nuclear weapons for deterrence (Q60: 0 = Not At All—10 = Completely)	4.6	3.7	-.9	<.0001
Should US build NMD (Q70: 1 = Definitely Should Not—7 = Definitely Should)	5.1	5.3	+.2	.0610
Nuclear retaliation against country that used nuclear weapons against the US (Q71: 1 = Strongly Oppose—7 = Strongly Support)	5.3	5.9	+.6	<.0001

Statistically significant differences existed between the mean preferences of women and men for four of these six issues. Men were significantly less optimistic than women about the prospects for nuclear abolition and about the degree to which conventional PGMs could replace nuclear weapons for deterrence. Men attached significantly more importance to retaining nuclear weapons than did women, and men were significantly more supportive of nuclear retaliation against a country that attacked the US with nuclear weapons.

Though men supported building national missile defenses more than women, on average, the difference was not quite significant at the 95 percent confidence level ($p = .0610$). Also, mean differences were not significant between the support of women and men for increasing funding to maintain the ability to develop and improve US nuclear weapons in the future.

Section 6.3: Relating Education and Nuclear Security

TABLE 6.8 SHOWS THE DISTRIBUTIONS OF RESPONDENTS TO EACH OF OUR four national surveys by education level. Note that the distributions have been quite similar since 1993, with about one-fourth of participants having only a high school education, about one-third having some college or vocational school training, about one-fifth reporting a bachelor's degree, and about one-sixth having accomplished some post-graduate training.

Table 6.8: General Public Respondents by Education Level: 1993–1999 (Q98)

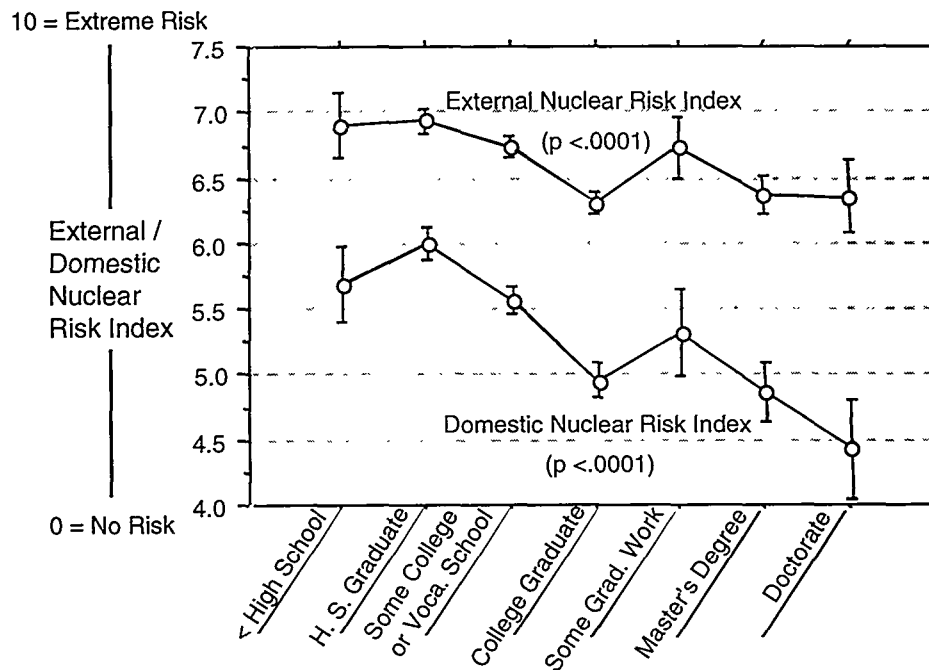
%	1999	1997	1995	1993
< High school graduate	5	7	6	6
High school graduate	25	27	28	24
Some college / voca. school	32	32	30	32
College graduate	22	18	20	20
Some graduate work	3	4	4	5
Master's degree	8	8	8	9
Doctorate	3	2	3	3
Other degree	1	1	NA	1

Education and Perceptions of Nuclear Risks and Benefits

Figure 6.7 presents results of analyses of variance comparing mean values for our external and domestic nuclear risk indices by level of education.⁷

⁷ For lists of component questions and explanations of how the external and domestic nuclear risk indices were calculated, see Volume I: Chapter Two.

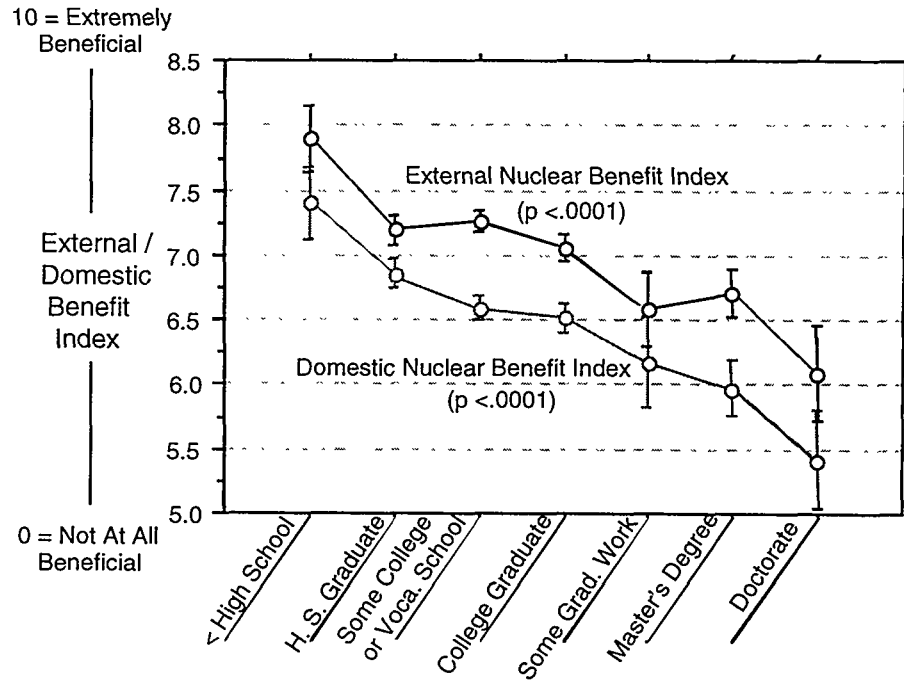
Figure 6.7: Mean Perceptions of the External and Domestic Nuclear Risk Indices by Education Level: 1999



Note that perceptions of external and domestic risks trended downward with increasing levels of education, and that the rate of decrease was steeper for perceptions of domestic risks than for external risks. Overall p-values for both external and domestic risk perceptions were highly statistically significant.

Figure 6.8 compares mean values of our external and domestic nuclear benefit indices by education level.

Figure 6.8: Mean Perceptions of the External and Domestic Nuclear Benefit Indices by Education Level: 1999



Perceptions of both external and domestic nuclear benefits decreased with increasing levels of education, and overall p-values were highly significant.

Clearly, education was importantly related to perceptions of risks and benefits associated with nuclear weapons. Increasing levels of education were associated with decreasing perceptions of external *and* domestic nuclear risks *and* benefits.

Education and Security Policy Preferences

Next, employing multiple bivariate regressions, we relate level of education to our six policy preferences previously used. Education level is used as a continuous independent variable where one means less than a high school degree, and seven means a doctorate level degree, and responses to each of our six policy issues are used as the dependent variables in separate regression analyses. Results are summarized in Table 6.9.

Table 6.9: Relating Education Level to Security Policy Preferences: 1999

Dependent Variable in Bivariate Regressions	Intercept	Coefficient	p Value	Adj. R ²
Feasible to eliminate nuclear weapons in next 25 years (Q30: 1 = Strongly Disagree—7 = Strongly Agree)	4.33	-.21	<.0001	.01
Importance of retaining nuclear weapons today (Q32: 0 = Not At All Important—10 = Extremely Important)	8.04	-.16	.0014	.01
Funding to sustain nuclear research infrastructure (Q40: 1 = Substantially Decrease—7 = Substantially Increase)	5.40	-.19	<.0001	.02
Degree to which PGMs can replace nuclear weapons for deterrence (Q60: 0 = Not At All—10 = Completely)	4.84	-.20	.0011	.01
Should US build NMD (Q70: 1 = Definitely Should Not—7 = Definitely Should)	5.97	-.25	<.0001	.03
Nuclear retaliation against country that used nuclear weapons against the US (Q71: 1 = Strongly Oppose—7 = Strongly Support)	6.21	-.20	<.0001	.02

Increasing levels of education were negatively related to each of our policy questions. An increase of one education level resulted in the following changes in responses to the policy issues: agreement with the statement that it is feasible to eliminate all nuclear weapons worldwide in the next twenty-five years decreased by 0.21; the importance of retaining nuclear weapons decreased by 0.16; support for increasing funding of nuclear infrastructure declined by 0.19; assessment of the degree to which conventional PGMs can replace nuclear weapons for deterrence decreased by 0.20; support for building a NMD system declined by 0.25; and support for nuclear retaliation decreased by 0.20. In each regression, the relationship was statistically significant, but education alone provided only modest explanatory powers.

Overall, increasing levels of education were associated with lower perceptions of external and domestic nuclear weapons risks, lower perceptions of external and domestic nuclear weapons benefits, lower views of the feasibility of nuclear abolition, lower assessments of the importance of retaining nuclear weapons, and less support for funding nuclear infrastructure, build-

ing national missile defenses, and retaliating with nuclear weapons. These relationships imply that as education increases, so too does skepticism about some traditional notions of nuclear security.

Section 6.4: Relating Income and Nuclear Security

IS INCOME SYSTEMATICALLY RELATED TO PERCEPTIONS AND PREFERENCES about nuclear security? Table 6.10 summarizes the distribution of respondents in 1999 by annual household income levels.

Table 6.10: Distribution of Household Incomes: 1999

\$000s	< 10	10– 20	20– 30	30– 40	40– 50	50– 60	60– 70	70– 80	80– 90	90– 100	> 100
1999 (%)	4	9	15	12	15	12	10	6	5	4	8

Income and Perceptions of Nuclear Risks and Benefits

Using annual household income as a continuous independent variable where a value of one equates to incomes below \$10,000, and eleven equates to incomes above \$100,000, we conducted multiple bivariate regressions in which income was used as the independent variable to predict values of our external and domestic risk and benefit indices.⁸ Our results are summarized in Table 6.11.

Table 6.11: Relating Household Income Levels to the Nuclear Risk and Benefit Indices: 1999

Dependent Variable	Intercept	Coefficient (Slope)	t Value	p Value	Adj. R ²
External Risk Index	6.85	-.03	-1.92	.0550	N/A
Domestic Risk Index	6.00	-.14	-6.09	<.0001	.03
External Benefit Index	7.24	-.02	-.97	.3338	N/A
Domestic Benefit Index	7.02	-.07	-3.06	.0023	.01

⁸ For lists of component questions and explanations of how the external and domestic nuclear risk indices were calculated, see Volume I: Chapter Two.

Levels of income were systematically related to perceptions of domestic nuclear risks and benefits. As income increased by one unit, perceptions of domestic nuclear risks decreased 0.14, and views of domestic benefits decreased 0.07. The relationship between income and the external nuclear risk index did not quite meet statistical significance at the 95 percent confidence level ($p = .0550$), but was close enough to warrant attention, and as income increased one unit, composite perceptions of the risks from other's nuclear weapons decreased 0.03. Income was not systematically related to our external benefit index. The explanatory power of income alone was small in each relationship.

Income and Security Policy Preferences

Again using annual household income as the independent variable, we conducted multiple bivariate regressions in which each of our six policy issues was the dependent variable. Results are summarized in Table 6.12.

Table 6.12: Relating Income Level to Security Policy Preferences: 1999

Dependent Variables in Bivariate Regressions	Intercept	Coefficient	p Value	Adj. R ²
Feasible to eliminate nuclear weapons in next 25 years (Q30: 1 = Strongly Disagree—7 = Strongly Agree)	4.26	-.12	<.0001	.02
Importance of retaining nuclear weapons today (Q32: 0 = Not At All Important—10 = Extremely Important)	7.45	.01	.6222	N/A
Funding to sustain nuclear research infrastructure (Q40: 1 = Substantially Decrease—7 = Substantially Increase)	4.82	-.01	.7143	N/A
Degree to which PGMs can replace nuclear weapons for deterrence (Q60: 0 = Not At All—10 = Completely)	4.86	-.13	<.0001	.01
Should US build NMD (Q70: 1 = Definitely Should Not—7 = Definitely Should)	5.43	-.05	.0162	<.01
Nuclear retaliation against country that used nuclear weapons against the US (Q71: 1 = Strongly Oppose—7 = Strongly Support)	5.58	-.01	.7413	N/A

Income level was not a systematic predictor of the perceived importance of retaining nuclear weapons, support for nuclear infrastructure funding, or support for nuclear retaliation. However, for each unit increase in household income, agreement that it is feasible to eliminate all nuclear weapons in the next twenty-five years decreased 0.12, the estimated degree to which conventional PGMs can replace nuclear weapons for deterrence declined 0.13, and support for building a NMD system declined 0.05.

Because income and education are correlated (chi-square $p < .0001$), we expected education and income to be related to nuclear security perceptions and preferences in similar ways. These data support that expectation, and they illustrate that of the two, education is more systematically related to views about nuclear security than is income, but the general trend is for perceptions of nuclear risks and benefits to decrease with higher levels of income and education, and for views of nuclear security issues to become more critical at higher levels of education and income.

Section 6.5: Summarizing Demographic Implications

Age

PERCEPTIONS OF EXTERNAL AND DOMESTIC NUCLEAR RISKS AND BENEFITS varied significantly by age group. Respondents 18–29 years of age rated external nuclear risks lowest and domestic nuclear risks highest among all age groups. From that starting point, perceptions of external risks rose until declining at ages above 50, and perceptions of domestic nuclear risks declined until rising sharply at ages 70 and above. Perceptions of external nuclear benefits were lowest among the 18–29 year old group, and rose substantially before declining for those respondents 70 years old and above. Perceptions of domestic nuclear benefits declined slowly with increasing age groups until rising sharply for those 60 years of age and older. When used as a continuous independent variable in separate bivariate regressions, age was related positively to perceptions of external and domestic benefits and negatively to perceptions of domestic risks. Age was not systematically related to perceptions of external nuclear risks.

Mean valuations of nuclear deterrence for preventing nuclear conflict during the Cold War and today and for preventing other countries from using

chemical and biological weapons today were lowest among the 18–29 year old group and increased significantly among higher age groups. When used as a continuous independent variable in bivariate regressions to predict responses to each of four deterrence valuation questions, age was systematically related, but age alone had very modest explanatory power. We found no evidence of cohort effect that would cause respondents who did not experience the Cold War as adults to value nuclear deterrence differently than those who did experience the Cold War as adults.

In separate bivariate regressions in which age was used as the independent variable to predict preferences about each of six policy issues, increasing age was systematically related to the following: (a) higher assessments of the importance of retaining nuclear weapons today; (b) greater support for funding for nuclear research capabilities; (c) lower assessments of the degree to which conventionally armed PGMs can replace nuclear weapons for deterrence; and (d) increasing support for nuclear retaliation against a country that used nuclear weapons against the US. Age was not systematically related to judgments about the feasibility of eliminating all nuclear weapons in the next twenty-five years or to preferences about building national missile defenses.

Gender

Women perceived significantly higher external and domestic nuclear weapons risks than did men, but gender was not systematically related to perceptions of external and domestic nuclear weapons benefits.

Significant differences between the preferences of men and women were found for some policy issues. Women considered eliminating all nuclear weapons in the next twenty-five years to be more feasible than did men, and they rated the importance of retaining nuclear weapons substantially lower than did men. Women judged the potential higher than men for conventional PGMs to replace nuclear weapons for purposes of deterrence, and women were significantly less supportive of nuclear retaliation against a country that attacked the US with nuclear weapons. Support for funding nuclear weapons research capabilities and for building a NMD system did not vary significantly by gender.

Education

Increasing levels of education were systematically related to decreasing perceptions of external and domestic nuclear risks and benefits.

Education also was importantly related to each of the six policy issues used as dependent variables in separate bivariate regressions. The following changes in policy preferences were associated with increasing levels of education: (a) decreasing assessment that the elimination of all nuclear weapons in the next twenty-five years is feasible; (b) declining importance of retaining nuclear weapons; (c) decreasing support for funding nuclear weapons research capabilities; (d) declining assessments of the degree to which conventional PGMs can replace nuclear weapons for deterrence; (e) decreasing support for building a NMD system; and (f) declining support for nuclear retaliation against a country that used nuclear weapons to attack the US.

Income

As income increased, perceptions of the risks from our own nuclear weapons and perception of the domestic benefits from the US nuclear arsenal decreased. Perceptions of external nuclear benefits were not systematically related to income levels, but perceptions of external risks, which declined slightly with increasing levels of income, were only slightly below statistical significance at the 95 percent confidence level ($p = .0550$).

Income was systematically related only to three of the six policy issues tested. As income level increased, (a) perceptions of the feasibility of eliminating all nuclear weapons in the next twenty-five years decreased; (b) assessments of the degree to which conventional PGMs can replace nuclear weapons for deterrence declined; and (c) support for building a NMD system decreased.

Volume I: Chapter Seven

Mapping Public Views About Nuclear Security

IN THIS CHAPTER WE INTEGRATE PUBLIC PERCEPTIONS, BELIEFS, AND preferences described in previous chapters into patterns that advance our research in two ways. First, we employ causal modeling techniques to measure linkages among respondents' demographic characteristics, perceptions of nuclear weapons risks and benefits, and policy beliefs as they relate to and help explain specific policy preferences. Causal modeling helps test some of the hypothesized relationships represented in our analytic model provided in Chapter One. Results show direct and indirect effects of different categories of independent variables on dependent policy options

Secondly, we employ n -dimensional cluster analysis techniques to examine the degree to which our respondents can be associated into groups sharing similar views about nuclear security. Such groupings are possible only if relationships among respondent characteristics, perceptions, beliefs, and preferences are sufficiently distinct and robust to support policy relevant associations. We hypothesized that such groupings could be identified among the general public, and that they would mirror similar groupings among policy elites, which are developed in Volume II.

The degree to which we can map key relationships and associations among members of general and elite publics as they pertain to nuclear security issues provides further evidence of the *coherence* of mass and elite views about the evolving nature of nuclear security. We conclude with a discussion of the coherence characteristics of data from this project.

Section 7.1: Causal Relationships

WE HYPOTHESIZED THAT INDIVIDUAL RESPONDENT CHARACTERISTICS such as gender, age, education, and political ideology (representing core beliefs) provide a predispositional context that influences

perceptions of nuclear weapons risks and benefits. For example, as illustrated in Chapter Six, our data show that women perceived statistically significantly greater external and domestic risks to be associated with nuclear weapons than did men. This characteristic held across general and elite publics and has been consistent over time.¹ Based on bivariate regressions, we also expected that some demographic influences would be strong enough to directly affect policy relevant beliefs and specific policy preferences.

In each phase of this project, we have found perceptions of nuclear weapons risks and benefits to be systematically related to policy and spending preferences about various dimensions of nuclear security. In Chapter Three we illustrated how our external and domestic nuclear risk and benefit indices were directly linked to respondents' preferences about selected policy issues.² For example, in each of our surveys of the general public, we found that perceptions of benefits associated with US nuclear weapons were more strongly related to policy preferences than were perceptions of risks associated with others' nuclear weapons or our own nuclear arsenal.

In Chapter Five we examined the bidirectional relationships between (a) perceptions of nuclear weapons risks and benefits and (b) our composite index of policy beliefs, and in Section 5.5 we illustrated how our policy belief index was predictably related to various nuclear weapons policy and spending issues. We further hypothesized that external and domestic nuclear weapons risks and benefits *and* policy beliefs influence policy and spending preferences separately and in combination.³

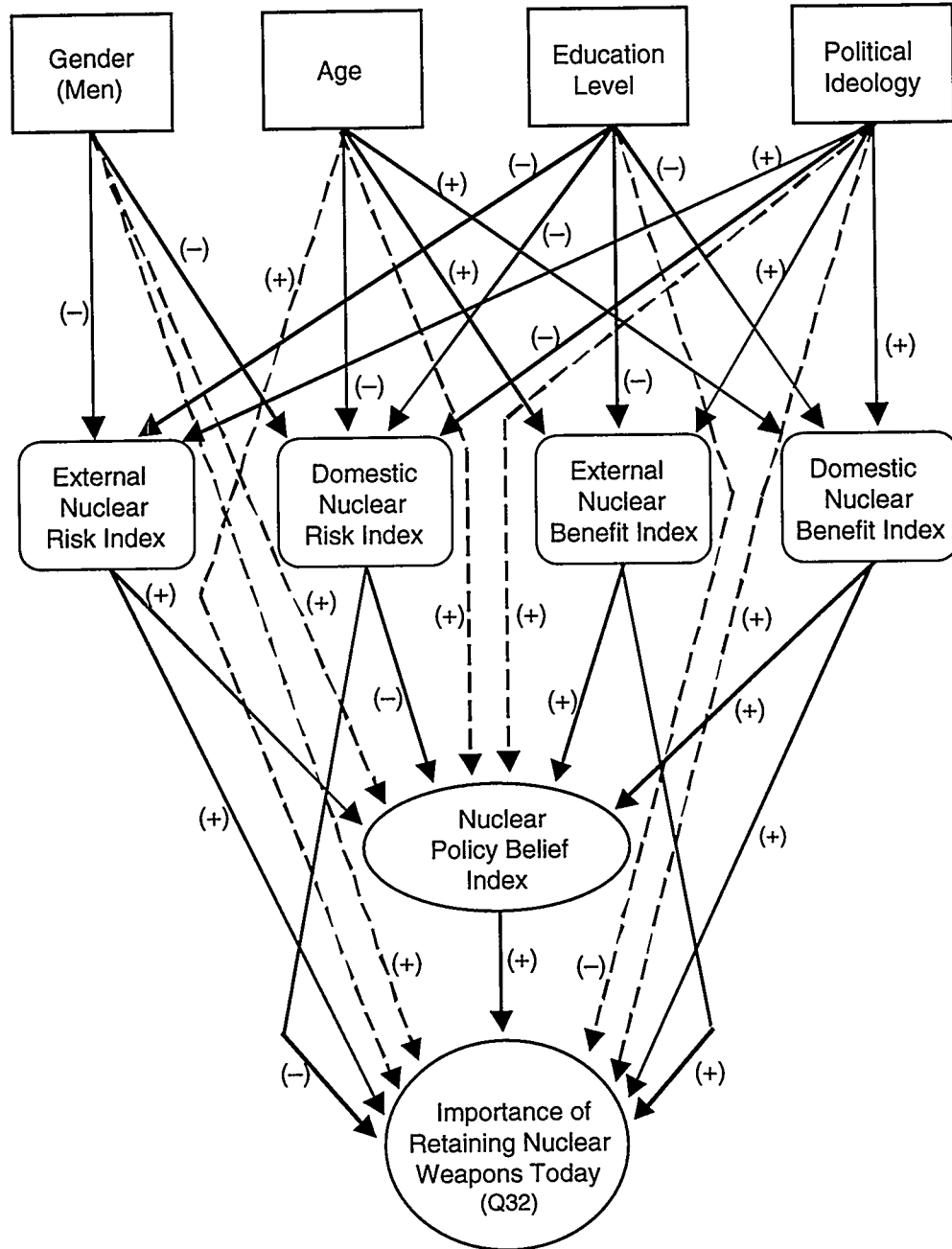
Based on these findings, we expected that the perceived importance of retaining nuclear weapons today could be represented by the conceptual model in Figure 7.1.

¹ For a comparison of perceptions of nuclear weapons risks among women and men scientists and among women and men legislators, see Herron and Jenkins-Smith, 1998, Chapter Five, Section 5.2.

² For other discussions of the relationships between perceptions of nuclear weapons risks and benefits and nuclear security policy issues, see Herron and Jenkins-Smith, 1996, Chapter Four, Section 4.5, and Herron and Jenkins-Smith, 1998, Chapter Four, Section 4.5.

³ For discussions of relationships between measures of political culture, nuclear risk and benefit perceptions, and security policy and spending preferences, see Herron and Jenkins-Smith, 1996, Chapter Six. For discussions of how multiple dimensions of ideology are related to nuclear risk and benefit perceptions and security policy preferences, see Herron and Jenkins-Smith, 1998, Chapter Six.

Figure 7.1: Possible Explanations for Respondents' Evaluation of the Importance of Retaining US Nuclear Weapons Today: 1999⁴



⁴ Question wording and distributions of responses are in Volume I: Appendix 2, Q32, and trends in mean responses are graphed in Figure 3.6

Key elements of the model and their expected directional influence on the importance of retaining nuclear weapons are as follows:

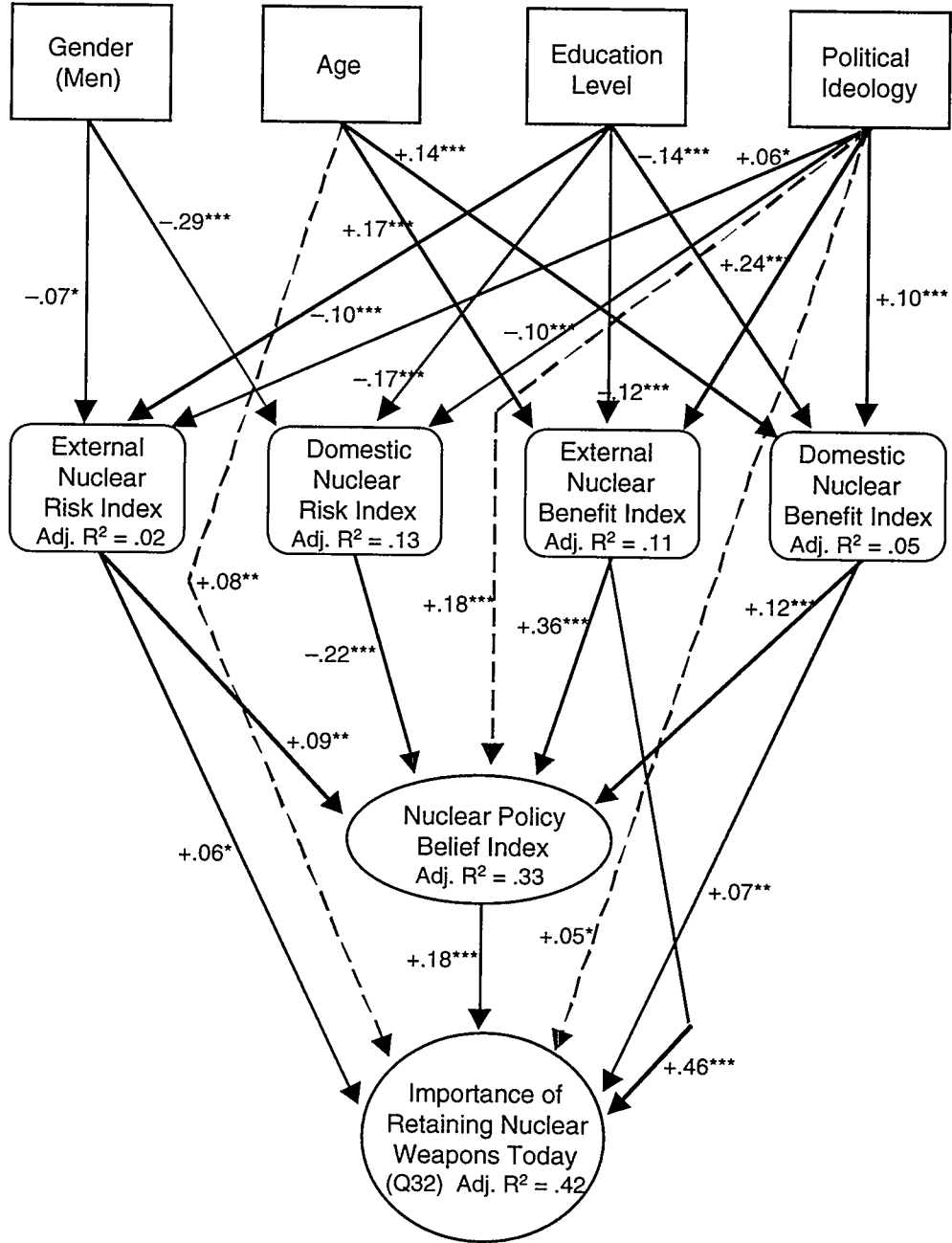
- **Gender:** We expected respondents who are men to (a) perceive lower external and domestic nuclear weapons risks; (b) score higher on the policy belief index (ascribing to more traditionalist views of nuclear security); and (c) assign greater importance to retaining nuclear weapons than did respondents who are women.
- **Age:** We expected increasing age to be associated with (a) lower perceptions of domestic nuclear risks; (b) higher perceptions of external and domestic nuclear benefits; (c) higher scores on our policy belief index; and (d) greater importance of retaining nuclear weapons.
- **Education:** Increasing levels of education were expected to be associated with (a) lower perceptions of external and domestic nuclear risks; (b) lower perceptions of external and domestic nuclear benefits; and (c) lower importance of retaining nuclear weapons.
- **Political Ideology:** As political conservatism increased, we expected to find (a) higher perceptions of external nuclear risks; (b) lower perceptions of domestic nuclear risks; (c) higher perceptions of external and domestic nuclear benefits; (d) higher scores on our policy belief index; and (e) greater importance assigned to retaining nuclear weapons.
- **External Nuclear Risk Index:** We expected increasing perceptions of risks to the US from others' nuclear weapons capabilities to be associated with (a) higher scores on our policy belief index, and (b) higher assessments of the importance of retaining nuclear weapons.
- **Domestic Nuclear Risk Index:** Increasing perceptions of risks associated with managing the US nuclear arsenal were expected to be related to (a) lower scores on our policy belief index, and (b) lower assessments of the importance of retaining nuclear weapons.
- **External Nuclear Benefit Index:** We expected to find perceptions of higher external benefits of US nuclear weapons to be associated with (a) higher scores on our policy belief index, and (b) higher importance of retaining nuclear weapons.

- **Domestic Nuclear Benefit Index:** As assessments of the domestic benefits of US nuclear weapons increased, we expected them to be associated with (a) higher scores on our policy belief index, and (b) higher assessments of the importance of retaining nuclear weapons.
- **Nuclear Policy Belief Index:** Finally, we hypothesized that increasing scores on our nuclear policy belief index would be associated with higher assessments of the importance of retaining nuclear weapons.

Using responses to questions about the beliefs and perceptions involved in these relationships, we calculated sequential multivariate regressions to measure expected effects. In the first stage of regressions, we used gender, age, education level, and political ideology as independent variables in multiple regressions to explain variation in each of our external and domestic nuclear risk and benefit indices. In the second stage, we used the same demographic variables, plus political ideology, and each of our four nuclear risk and benefit indices as independent variables in multiple regressions to explain variation in our policy belief index. In the third stage, we employed demographic characteristics, political ideology, risk and benefit indices, and the policy belief index to predict change in assessments of the importance of retaining US nuclear weapons today.

This process allows us to see which independent variables act through intermediate variables and which act directly on our final dependent variable. Figure 7.2 shows those statistical relationships that were significant at the 95 percent confidence level. The directions and size of the standardized regression coefficients should be interpreted as follows: a change of one standard deviation in the independent variable produces the fractional change of one standard deviation in the dependent variable represented by the standardized coefficient. For example, a standardized coefficient of 0.25 means that a change of one standard deviation in the independent variable results in a change of 0.25 standard deviation in the dependent variable. Because the coefficients are all standardized, they can be compared to one another. Statistical significance is represented as follows: regression outcomes having p-values of 0.05 or less are represented by one asterisk; those having p-values of 0.01 or less are shown by two asterisks; and those outcomes with p-values of 0.001 or less are indicated by three asterisks. Explanatory powers are shown as R^2 values. Dashed lines are used to simplify interpretation and prevent confusion in recognizing causal paths that extend beyond the adjacent echelon of the model. Otherwise, solid and dashed lines do not imply differences.

Figure 7.2: Estimating Causes of Variation in Assessments of the Importance of Retaining US Nuclear Weapons: 1999



As Figure 7.2 shows, most of our hypothesized relationships were supported by regression results. Of those relationships that reached statistical signifi-

cance, all were in the expected directions. However, note that the following hypothesized causal relationships were *not* supported by path analysis:

- The direct influence of gender on policy beliefs or on the importance of retaining nuclear weapons
- The influence of age on perceptions of domestic nuclear risks
- The direct influence of age on policy beliefs
- The direct influence of level of education on the importance of retaining nuclear weapons
- The direct influence of perceptions of domestic nuclear risks on the importance of retaining nuclear weapons

Causal paths that *were* sustained at the 95 percent confidence level produced the standardized coefficients shown and yielded these implications:

- **Gender:** Direct effects of gender were limited to perceptions of external and domestic nuclear risks. Being male resulted in a decrease of 0.07 standard deviation on the external nuclear risk index and a decrease of 0.29 standard deviation on the domestic nuclear risk index. All other implications of gender for the retention issue were indirect influences operating through external and domestic risk perceptions and policy beliefs.
- **Age:** The direct effects of one standard deviation increase in respondent age included a corresponding increase of 0.17 standard deviation in perceptions of external nuclear benefits, an increase of 0.14 in perceptions of domestic nuclear benefits, and an increase of 0.08 in the rated importance of retaining nuclear weapons. Indirect effects of age on the retention issue were effected through the external and domestic nuclear benefit indices and our index of policy beliefs.
- **Level of Education:** Education provided a direct influence on each of our four nuclear risk and benefit indices. An increase of one standard deviation in the level of education of respondents resulted in (a) a decrease of 0.10 standard deviation in perceptions of external nuclear risks; (b) a decrease of 0.17 in perceptions of domestic nuclear risks; (c) a decrease of 0.12 in perceptions of external nuclear benefits; and (d) a decrease of 0.14 in domestic nuclear benefit percep-

tions. All other effects of education were indirectly applied through the risk and benefit indices and policy beliefs.

- **Political Ideology:** An increase of one standard deviation in political conservatism resulted in the following direct influences: (a) perceptions of external nuclear risks increased 0.06; (b) perceptions of domestic nuclear risks decreased 0.10; (c) external nuclear benefit perceptions increased 0.24; (d) domestic nuclear benefit perceptions increased 0.10; (e) scores on our policy belief index increased 0.18; and (f) assessments of the importance of retaining nuclear weapons increased 0.05 standard deviation.
- **External Nuclear Risk Index:** Perceptions of the risks posed by others' nuclear weapons were related both to policy beliefs and to the retention issue, but the effects were small. An increase of one standard deviation in perceptions of external nuclear risks caused an increase of 0.09 standard deviation in our index of nuclear policy beliefs and an increase of 0.06 in the importance of retaining nuclear weapons.
- **Domestic Nuclear Risk Index:** A one standard deviation increase on the domestic nuclear risk index resulted in a decrease of 0.22 standard deviation on the policy belief index. Implications of domestic risk perceptions on the retention issue were entirely indirect effects through the belief index.
- **External Nuclear Benefit Index:** Perceptions of the external benefits of US nuclear weapons strongly influenced both the nuclear policy belief index and assessments of the retention issue. An increase of one standard deviation on the external nuclear benefit index caused an increase of 0.36 standard deviation on the policy belief index and an increase of 0.46 on assessments of the importance of retaining US nuclear weapons. Perceptions of external benefits provided the most influential independent variable in our model affecting this policy issue.
- **Domestic Nuclear Benefit Index:** An increase of one standard deviation on the domestic nuclear benefit index caused an increase of 0.12 standard deviation on the policy belief index and an increase of 0.07 in the assessed importance of retaining nuclear weapons.
- **Nuclear Policy Belief Index:** As scores on the nuclear policy belief index increased by one standard deviation (increasingly supportive of

traditional views of nuclear security), the importance of retaining US nuclear weapons today increased 0.18 standard deviation.⁵

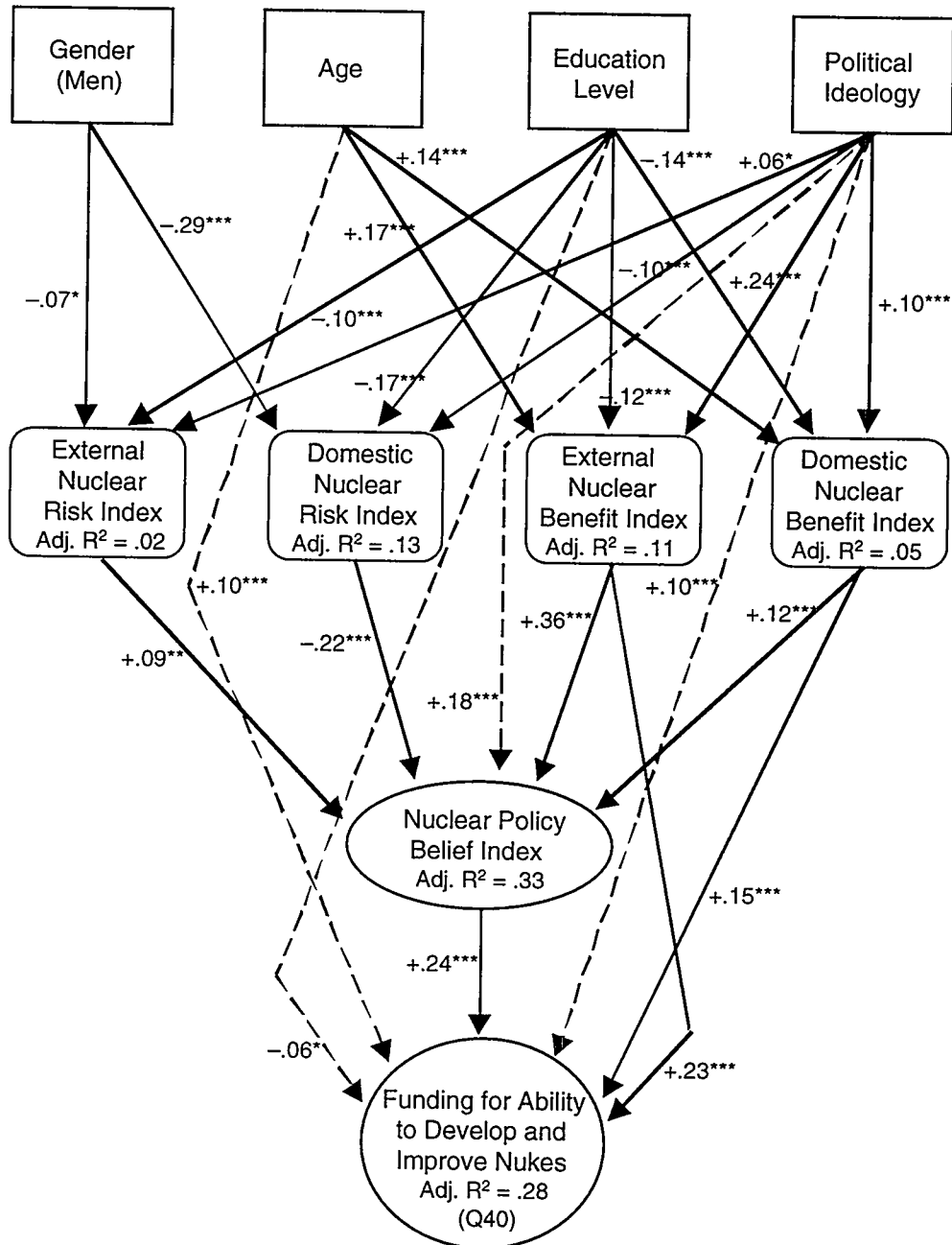
The combined effects of the independent variables modeled above explain (a) 2 percent of variation in perceptions of external nuclear risks; (b) 13 percent of variation in perceptions of domestic nuclear risks; (c) 11 percent of change in perceptions of external nuclear benefits; (d) 5 percent of change in perceptions of domestic nuclear benefits; (e) 33 percent of variation in our nuclear policy belief index; and (f) 42 percent of change in assessments of the importance of retaining US nuclear weapons today.

To illustrate some of the causal relationships affecting spending preferences, we hypothesized that the relationships shown in Figure 7.1 also would explain variation in responses to a question that asked respondents to indicate how they thought spending should change for maintaining the ability to develop and improve nuclear weapons in the future. Responses were provided on a scale where one meant “substantially decrease,” and seven meant “substantially increase.”⁶ Results of the causal modeling are shown in Figure 7.3.

⁵ As shown in Volume I: Chapter Five, Section 5.4, the relationships evident in our data are consistent with bidirectional influence between perceptions of nuclear risks and benefits and nuclear policy beliefs. For simplicity of modeling causal paths, we have shown only the influence of risk and benefit perceptions on policy beliefs, but the reader is reminded that the relationships are likely to be interactive.

⁶ Question wording and distributions of responses are in Volume I: Appendix 2, Q40, and mean response trends are graphed in Figure 3.12.

Figure 7.3: Estimating Causes of Variation in How Spending Should Change for Maintaining the Ability to Develop and Improve Nuclear Weapons: 1999



Results should be interpreted as explained in the prior discussion. While the causal relationships were in the same directions as hypothesized and were similar to those found in our previous model, two changes are noteworthy. First, education was directly linked not only to the four nuclear risk and benefit indices, but also to assessments of how spending should change for maintaining the ability to develop and improve nuclear weapons in the future. Second, perceptions of external nuclear risks were not directly related to our spending issue, operating only indirectly through the policy belief index. Also, the explanatory power of this model was less than our previous one, yielding an adjusted R^2 of 0.28.

Though other causal analyses could be performed to explain how various independent variables are influencing dependent policy variables, these two models illustrate some of the causal paths, relationships among independent variables, and implications for dependent policy preferences that we hypothesized in our analytic model. A key finding is that expected relationships and influences *are* evident, and these results further substantiate previous findings about how members of the general public form policy preferences about nuclear security issues. For further insights we next employ cluster analysis to separate and characterize distinct groups of respondents according to their views about nuclear security issues.

Section 7.2: Grouping Respondents

Cluster Analysis

AS DISCUSSED IN VOLUME II, WE EXPECTED POLICY ELITES TO EXHIBIT sufficiently distinct views about nuclear security to support grouping into policy advocacy coalitions.⁷ But do members of the general public exhibit sufficient coherence of views about nuclear security that they too can be organized into policy relevant groupings? To investigate this question, we employed n -dimensional large group cluster analysis, using the hierarchical agglomeration method and within-group average linking. The rescaled squared Euclidean measure was used.⁸ The grouping variables were

⁷ For a discussion of the advocacy coalition framework for policy analysis, see Sabatier and Jenkins-Smith, 1993, 1999.

⁸ For a discussion of cluster analysis methods, see Norusis, 1994.

our external and domestic nuclear weapons risk and benefit indices.⁹ The number of clusters was determined after calculating iterations with from two to six clusters and determining that after four clusters further separation yielded groups too small to be statistically useful for characterizing policy views. Because each of our nuclear risk and benefit indices are composite aggregations of mean responses to multiple questions, a nonresponse to any one of the component questions eliminated that respondent from inclusion in the cluster analysis. After nonresponses were excluded, the size and proportions of the four resulting clusters are shown in Table 7.1.

Table 7.1: Size of Clusters Based on External and Domestic Nuclear Risk and Benefit Indices: 1999

General Public	Group 1	Group 2	Group 3	Group 4	Total
Number	396	454	251	204	1305
Percent	30	35	19	16	100

Characterizing the Clusters

Demographic Characteristics

Table 7.2 shows the percent of each group that were men, the mean ages of each group, their mean education levels, and the mean annual household incomes for each of our four clusters.

⁹ For lists of component questions and explanations of how our external and domestic nuclear risk and benefit indices were calculated, see Volume I: Chapter Two.

Table 7.2: Demographic Characteristics of Clusters: 1999

Demographic Characteristic	Group 1	Group 2	Group 3	Group 4	p Value
% Men	52.7	32.6	54.2	52.5	<.0001
Mean Age (Range: 18–98)	41.8	42.7	44.4	50.4	<.0001
Mean Educa. (Scale: 1–6) ¹⁰	3.7	3.0	3.4	3.2	<.0001
Mean Income (Scale: 1–11) ¹¹	5.9	5.1	5.7	5.3	.0004

Group 1: Members of this group were the youngest, highest educated, and earned the highest incomes. About 53 percent were men.

Group 2: About two-thirds were women. Members of this group were the second youngest, the least educated, and earned the lowest incomes.

Group 3: Members were the second oldest, had the second highest level of education, and earned the second highest incomes. About 54 percent were men.

Group 4: This group's members were the oldest, had the second lowest level of education, and earned the second lowest incomes. About 53 percent were men.

Overall differences across all four groups were statistically significant for each demographic category.

¹⁰ Education categories are discussed in Volume I: Chapter Six, Section 6.3. Frequency distributions are provided in Volume I: Appendix 2, Q98.

¹¹ Income categories are discussed in Volume I: Chapter Six, Section 6.4. Median ranges are provided in Volume I: Appendix 2, Q99.

Characterizing Nuclear Risk and Benefit Perceptions

As previously noted, we used our four nuclear weapons risk and benefit indices as the grouping variables to perform the cluster analysis. Here we illustrate the differences among risk and benefit perspectives that produced the four groupings. Table 7.3 compares mean values for each of our four risk and benefit indices across the four groups of respondents. All are on scales from zero to ten.

Table 7.3: Mean Nuclear Risk and Benefit Perceptions of Clusters: 1999

Risk/Benefit Indices	Group 1	Group 2	Group 3	Group 4	p Value
External Risk	5.4	7.6	7.8	5.8	<.0001
Domestic Risk	4.0	7.2	4.7	4.5	<.0001
External Benefit	5.8	7.5	7.8	8.3	<.0001
Domestic Benefit	5.5	7.2	5.6	8.8	<.0001

Group 1: Members assigned the lowest mean values to each of our four risk and benefit indices.

Group 2: Participants rated domestic risks of US nuclear weapons substantially higher than any other group. Also they rated external risks second highest, and external benefits second lowest. Somewhat surprisingly, they rated the domestic benefits of US nuclear weapons relatively high.

Group 3: Members perceived the highest mean external nuclear risks, the second highest domestic risks and external benefits, and the second lowest domestic benefits.

Group 4: On average, participants rated external and domestic risks second lowest and external and domestic benefits highest among all four groups.

Differences across groups for each index of nuclear risks and benefits were highly statistically significant.

Characterizing Beliefs

Table 7.4 compares mean group scores for self-rated political ideology (core beliefs) and for our nuclear policy belief index (policy core beliefs).¹²

Table 7.4: Mean Belief Scores by Cluster: 1999

Belief Scores	Group 1	Group 2	Group 3	Group 4	p Value
Political Ideology (1 = Strongly Liberal— 7 = Strongly Conservative)	4.1	4.3	4.7	4.7	<.0001
Policy Belief Index (0 = Most Critical of Traditional Views—9 = Most Supportive)	5.1	5.4	6.1	6.6	<.0001

Group 1: Members of this group were the most politically liberal, and their mean score on our policy belief index was lowest, indicating the most anti-establishment views about nuclear security.

Group 2: Participants were the second most liberal and held the second most critical views of traditional nuclear security.

Group 3: Participants tied for the most politically conservative views with Group 4 and held the second most supportive views of traditional nuclear security concepts.

Group 4: Members tied for the most conservative views with Group 3 and scored highest on our policy belief index, indicating the most traditional and establishmentarian views about nuclear security.

¹² According to the advocacy coalition framework for policy analysis, core beliefs are deeply held values reflecting fundamental normative and ontological axioms. Core beliefs are highly resistant to change. Policy core beliefs reflect fundamental policy positions concerning the basic strategies for achieving the normative axioms associated with core beliefs. For a more detailed discussion, see Sabatier and Jenkins-Smith, 1993.

Composite Group Profiles

Before examining the views of our four groups about selected nuclear security policy and spending issues, it is useful to summarize the profiles for each group.

Group 1 Profile: Members of this group were the youngest and most highly educated and paid. They perceived the lowest nuclear risks and benefits, and were the most politically liberal and critical of traditional views about nuclear security. Group 1 constituted a polar position opposite that of Group 4.

Group 2 Profile: Members of Group 2 were predominately women and were the second youngest, least educated, and lowest paid respondents. They rated both nuclear risks and benefits relatively high, with mean ratings for all four indices above 7.0. They were the second most politically liberal and second most critical of establishment policies about nuclear security.

Group 3 Profile: Participants in this group were the second oldest, held the second highest levels of education, and earned the second highest incomes. They perceived the highest mean external nuclear risks, the second highest domestic risks and external benefits, and the second lowest domestic benefits. Members tied with those in Group 4 for being the most politically conservative, and they scored second highest on the policy belief index.

Group 4 Profile: Group members were oldest by a substantial margin, had the second lowest levels of education, and earned the second lowest incomes. They perceived relatively low external and domestic nuclear risks and the highest external and domestic benefits among all groups. Members tied with those of Group 3 for being most politically conservative, and scored highest on the policy belief index. Group 4 constituted a polar position opposite that of Group 1.

Predicting Group Preference for Security Policies

Based on the characteristics of the clusters described above, and using the associated group identity appropriate to each respondent, we should be able to explain relative levels of group support and opposition to a variety of nuclear security policy and spending issues. Doing so is possible only if group

members exhibit expected linkages among demographic attributes, core and policy beliefs, risk and benefit perceptions, and policy preferences. Table 7.5 lists six policy and spending issues and our expectations for relative mean values based on group characteristics.

Table 7.5: Expected Relative Valuations of Selected Nuclear Policy Issues Based on Group Association: 1999

Nuclear Security Policy Issue	Group 1	Group 2	Group 3	Group 4
Q24: Minimum number of US nuclear weapons (1 = 7,000—6,500—15 = Zero)	Highest Values (Fewest Weapons)	High Values	Low Values	Lowest Values (Most Weapons)
Q32: Importance of retaining nuclear weapons (0 = Not At All Important—10 = Extremely Important)	Lowest	Low	High	Highest
Q37: Spending to maintain existing nuclear weapons in reliable condition (1 = Substantially Decrease—7 = Substantially Increase)	Lowest	Low	High	Highest
Q40: Spending to maintain ability to develop & improve nuclear weapons (1 = Substantially Decrease—7 = Substantially Increase)	Lowest	Low	High	Highest
Q70: Should US build NMD? (1 = Definitely Should Not—7 = Definitely Should)	Lowest	Low	High	Highest
Q71: US nuclear retaliation to a nuclear attack on US (1 = Strongly Oppose—7 = Strongly Support)	Lowest	Low	High	Highest

Table 7.6 compares actual mean values for each of the same policy and spending issues by respondent group.

Table 7.6: Mean Valuations of Selected Nuclear Policy Issues Based on Group Association: 1999

Nuclear Security Policy Issue	All (Means)	Group 1	Group 2	Group 3	Group 4	p Value
Q24: Minimum number of US nuclear weapons (1 = 7,000–6,500—15 = Zero)	9.7	10.7	9.7	9.3	8.0	<.0001
Q32: Importance of retaining nuclear weapons (0 = Not At All Important—10 = Extremely Important)	7.5	6.3	7.6	8.2	8.8	<.0001
Q37: Spending to maintain existing nuclear weapons in reliable condition (1 = Substantially Decrease—7 = Substantially Increase)	5.0	4.4	5.1	5.4	5.6	<.0001
Q40: Spending to maintain ability to develop & improve nuclear weapons (1 = Substantially Decrease—7 = Substantially Increase)	4.8	4.0	4.9	5.0	5.7	<.0001
Q70: Should US build NMD? (1 = Definitely Should Not—7 = Definitely Should)	5.1	4.5	5.2	5.5	5.7	<.0001
Q71: US nuclear retaliation to a nuclear attack on US (1 = Strongly Oppose—7 = Strongly Support)	5.5	5.0	5.5	5.9	6.2	<.0001

As shown by comparing Tables 7.5 and 7.6, expected intergroup relationships held for each issue, and overall differences in means were highly statistically significant. These findings illustrate that views among our respondents from the general public were sufficiently consistent and coherent to afford distinct groupings of perspectives about a range of complex nuclear security policy issues. In Volume II we characterize elite perspectives by

using a similar technique that bridges between associations of general public and expert views.

Section 7.3: Public Coherence

RATHER THAN SUMMARIZE FINDINGS FROM THIS AND EARLIER chapters, we refer the reader to the summary sections at the ends of previous chapters and to our Executive Summary. For our concluding comments, we choose to reflect on the coherence of public views about nuclear security. To date we have conducted fifteen focus groups, four national surveys of the general public, surveys of three different scientist groups, a survey of state legislators from all fifty states, and fifty in-depth interviews with security policy elites. Between 1993 and 1999, more than 11,000 Americans generously shared their views with us about nuclear security and related issues. We have reported many policy relevant findings, but one of the most important overall conclusions relates to the *coherence* of public views. Rather than confused and disjointed ramblings of disinterested and disengaged publics, we have documented a very high degree of consistence and connectedness among the views of Americans about the future of nuclear security. Several dimensions of coherence are particularly noteworthy.

Temporal Coherence

The stability of public views over time is remarkable. That is not to imply that views do not evolve, but changes in views about nuclear security largely have been consistent in direction and similar in magnitude over time. During the period of our measurements (1993–1999), changes have *not* been erratic or volatile. The consistency of composite measures of nuclear weapons risks and benefits and valuations of nuclear deterrence reported in Chapters Two and Three illustrate the stability of public views over our period of study. The directional consistency and magnitude of interval changes in views about nuclear security policies reported in Chapter Three provide reliable indications about key trends in evolving sentiments. We find the over time measurement of public beliefs, perceptions, and preferences about nuclear security to exhibit high degrees of temporal coherence.

Topical Coherence

We also have reported strong and predictable connections among views about complex nuclear security topics. For example, we have found logically consistent linkages between perceptions of nuclear risks and benefits, preferences for numbers of nuclear weapons, and views about strategic arms control. In another example, most respondents have not been confused about the twin dimensions of nuclear abolition. Many think a nuclear weapons free world is desirable, but most remain unconvinced that it is feasible in the foreseeable future. They support reducing nuclear weapons, but going to zero is a qualitatively different issue currently not supported by most Americans we have surveyed. In these and other areas we find a logical consistency among views about related dimensions of complex topics that indicate strong topical coherence.

Relational Coherence

Supporting the coherence among public views about related security topics is a high degree of coherence between and among respondent characteristics, perceptions, beliefs, and policy preferences. In addition to measuring and reporting policy relevant views about specific issues, we also have investigated the statistical relationships between key variables that give insights into why and how views about nuclear security are shaped. Our findings indicate a very high degree of coherence in the ways in which publics relate different dimensions that affect opinion formation and change. Certainly we have not been able to definitively map all these relationships. But for those that we have studied, the consistency with which key elements are systematically related indicates that even though many members of the general public do not possess technical knowledge about nuclear weapons designs, nuclear deterrence, delivery systems, foreign policy, and many other aspects of nuclear security, they nevertheless manage to connect important “dots” that form a security picture with a *very* high degree of relational coherence.

Associational Coherence

Finally, in our 1999 study we wanted to test whether the structure and coherence of views among the general public was sufficient to discern patterns of associated views not unlike those we found among scientists and legislators, and those we expected to find in our extensive interviews with policy experts. Findings from the cluster analysis presented earlier in this chapter provide empirical evidence that general public views about nuclear security can be associated into groups sharing a high degree of intragroup consistency and exhibiting policy relevant intergroup distinctions. Understanding such groupings of views can yield important insights about how nuclear security policy debates may be received by various publics, and where overlapping views may provide fertile ground for policy evolution. The high degree of associational coherence among members of the general public also provides a useful bridge for relating to corresponding groups of views among policy elites.

The Public is *Not* “Stupid”

Our research in this project (and in many other policy areas) reinforces our confidence in the basic soundness of public opinion when it is carefully assessed. It's easy to ask factual knowledge questions that illustrate how little some Americans know about technical details associated with complex policy areas such as nuclear security. Answers to knowledge questions in some polls, particularly about science, are sometimes reported so as to imply that the public is “stupid.” And to some experts with specialized training and information, a lack of factual knowledge about technical aspects of security policy disqualifies most members of the general public from having an important role in debates about nuclear security. But our research leads us to a quite different conclusion. In the aggregate, the American general public exhibits a very substantial capability for participating in and contributing to future debates about key issues that are integral to security policy evolution. Just as Benjamin Page and Robert Shapiro concluded in *The Rational Public*¹³ (a macroanalysis of more than 1,000 repeated questions asked in hundreds of surveys over fifty years), we agree that the American public can appropriately be characterized as “rational” and that they certainly are *not* “stupid.”

¹³ Page and Shapiro, 1992.

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Volume I: Appendix 1

Research Methodology

Section 1: Sampling

A SAMPLE FRAME OF RANDOMLY SELECTED AND RANDOMLY ORDERED households having one or more telephones was purchased from Survey Sampling, Incorporated, of Fairfield, Connecticut. The sample frame was drawn from a random digit database, stratified by county, in which each telephone exchange and working block had a probability of selection equal to its share of listed telephone households. This was accomplished as follows. All blocks within a county were organized in ascending order by area code, exchange, and block number. After a proportional quota had been allocated to all counties in the frame, a sampling interval was calculated by summing the number of listed residential numbers in each eligible block within the county and dividing that sum by the number of sampling points assigned to the county. From a random start between zero and the sampling interval, blocks were systematically selected in proportion to their density of listed households. After a block was selected, a two-digit random number in the range 00–99 was appended to the exchange and block to form a ten digit telephone number. Known business numbers were eliminated.

The sample frame was loaded into a computer assisted telephone interviewing system which selected and dialed the individual numbers. Each household had an equal chance of being called. Probability sampling was extended within each household by interviewing only the member of the household over the age of 18 with the most recent birthday. Up to ten attempts were made to contact the individual selected for the sample. No substitutions were made. The number of working residential phone lines at each residence contacted was recorded in order to obtain weights that allow corrections for multiple-phone households.

Table A1.1 compares key demographics of our survey participants to national and regional population parameters to illustrate the representativeness of survey respondents compared to their parent populations.

Table A1.1: Demographic Representativeness of Respondents

Demographic Category	US National Population (%)	Survey Respondents (%)
Gender¹		
Men	48.9	44.4
Women	51.1	55.6
Age²		
18–24	12.8 ³	11.7
25–54	58.4 ⁴	64.3
> 54	28.6 ⁵	24.0
Education⁶		
H.S. Graduate or Higher	82.8	94.5
College Grad. or Higher	24.4	36.5
Race / Ethnicity⁷		
White, non-Hispanic	71.8	79.3
Black	12.1	7.5
Hispanic (any race)	11.5	4.6
American Indian	0.7	2.4
Asian	3.8	1.9
Other	N/A	4.4

¹ U.S. Bureau of the Census, 1999a.

² Ibid.

³ The proportion of the total US population 18–24 years of age is 9.6 percent. Of all those 18 or older, 12.8 percent are 18–24 years of age. The latter number is used for comparison with our respondents, because by design we excluded individuals below the age of 18 from our survey.

⁴ The portion of the total US population 25–54 years of age is 43 percent. Of all those 18 or older, 58.4 percent are 25–54 years of age.

⁵ The portion of the total US population over 54 years of age is 21 percent. Of all those 18 or older, 28.6 percent are over the age of 54.

⁶ U.S. Bureau of the Census, 1999b.

⁷ U.S. Bureau of the Census, 1999c.

Table A1.1 (cont.): Demographic Representativeness of Respondents

Demographic Category	US National Population (%)	Survey Respondents (%)
Household Income⁸		
\$0–49,999	61.3	54.9
\$50,000–99,999	28.2	36.8
\$100,000 and above	10.5	8.3
Region⁹		
Northeast ¹⁰	19.3	19.2
Midwest ¹¹	23.2	24.5
South ¹²	35.3	35.3
West ¹³	22.2	21.0

Section 2: Data Collection

THE NATIONWIDE TELEPHONE SURVEY WAS CONDUCTED BY THE University of New Mexico’s Institute for Public Policy (IPP) between 13 September and 14 October 1999. Before data collection began, an extensive review of the survey instrument was conducted by the IPP’s senior interviewing staff, Survey Research Center (SRC) supervisors, and the SRC manager. During this step the survey was checked for biased or misleading questions or content that might be culturally insensitive or threatening to different socioeconomic or demographic groups. This process assured that the instrument did not inadvertently induce respondents from

⁸ U.S. Bureau of the Census, 1999d.

⁹ U.S. Bureau of the Census, 1999e. Alaska, Hawaii, Micronesia, Guam, Marshall Islands, Northern Mariana Islands, Palau, Puerto Rico, Midway Islands, and the Virgin Islands were not included in the sample frame.

¹⁰ States included in the *Northeast* region included Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

¹¹ States included in the *Midwest* region included Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

¹² States included in the *South* region included Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

¹³ States included in the *West* region included Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

different groups or classes to drop out before completing the survey. Also during this step the skip patterns used throughout the survey were checked to assure that the specified research parameters were met. Then a verbal protocol test was conducted with two senior interviewers to identify any remaining problematic question wording or computer programming errors.

When the instrument was in final form, about two hours of training was conducted with each of the approximately forty interviewers and supervisors to insure they were proficient in the standardized procedures and terminology of the survey instrument. This process entailed oral reading of the survey instrument in several group training sessions to make sure that proper and consistent emphasis was given to the various words and phrases specified in the survey, and to assure that respondents were interviewed using consistent phrasing, emphasis, and protocols during the data collection process. Data collection did not begin until each interviewer demonstrated thorough competence with the survey instructions and reading aloud the survey.

The interviews were conducted in the IPP Survey Research Center by experienced interviewers (all were graduate or undergraduate students at the University of New Mexico) using a computer assisted telephone interviewing system that recorded data in a centralized collection file. Rigorous supervision and quality control measures were applied throughout the data collection process. No interviews were conducted without the presence of a shift supervisor. A silent monitor was used by supervisors to evaluate individual interviewers and to insure high quality and continuity in application of the survey protocols throughout the data collection phase. The quality of the data collected was continually monitored to assure that the proper proportions of the desired socioeconomic and demographic characteristics were maintained. These procedures included daily data downloading and analysis of the frequencies and diagnostics, such as the degree of "reluctance" of survey participants, the proportions of collections by region, and standardized recording of verbatim responses where appropriate.

The sample size and random selection procedures provide plus or minus 2.6 percent sampling error. The cooperation rate was 60.1 percent. This rate compares directly (and favorably) to rates previously reported for earlier stages of this project (1993: 53.3 percent; 1995: 55.7 percent; 1997: 54.8 percent).

Since 1993, when we began this project, methods for calculating cooperation rates and response rates have been redefined. The American Association for Public Opinion Research now recommends procedures for calculating response and cooperation rates that account differently for potential respondents who refuse to participate before their eligibility can be determined, those who cannot participate because of language barriers, those who are institutionalized or too ill to participate, and those who are away on extended travel that prevents participating during the period of the survey.¹⁴ Under the latest AAPOR methods, our cooperation rate for 1999 was 52.0 percent, and our response rate was 43.5 percent.

Section 3: Data Analysis

We employed the following types of analyses:

- *Descriptive Analyses:* Frequency distributions and central tendencies for all questions in the 1999 survey and for those questions from the 1993, 1995, and 1997 surveys that were used for comparisons are provided in Volume I: Appendix 3, and most are discussed in detail in the report.
- *Relational Analyses:* Standard statistical techniques such as analysis of variance, correlations, and ordinary least squares regressions were used to investigate relationships among individual and grouped variables. Since 1993, we have sought to identify and measure many of the important variables influencing public preferences about strategic policy and spending. Using combinations of independent variables, we were able to predict substantial portions of the variation in key dependent variable policy and spending preferences.
- *Trend Analyses:* By comparing key questions first asked in 1993 and repeated in 1995, 1997, and 1999, we were able to assess trends in the evolution of US perceptions and nuclear security policy and spending preferences. Also we were able to illustrate the consistency with which key variables were related over time.

¹⁴ The American Association for Public Opinion Research, 1998.

- *Causal Analyses:* We employed path analysis to help identify and measure the direct and indirect effects of some of the most important independent variables on key dependent policy variables.
- *Cluster Analyses:* *N*-dimensional cluster analysis techniques were used to identify groups of respondents with similar perceptions of nuclear risks and benefits. Group identity was then used to predict systematic policy and spending preferences among members.

Volume I: Appendix 2

General Public Focus Groups

FOCUS GROUPS ARE GUIDED DISCUSSIONS CONDUCTED IN SMALL GROUP environments that help us explore public perceptions and insights about policy issues. They are more free-form and open-ended than structured surveys. Focus group dynamics often illuminate issues, concerns, or levels of knowledge that help us design lines of inquiry, choose appropriate terminology, and prioritize issues that can be examined more systematically in surveys.

Since 1993 we have conducted fifteen focus group discussions and two verbal protocol meetings in eight cities for this project. For the 1999 phase of the study, we held three focus groups among members of the general public in Boston, Dallas, and Portland, and we conducted one focus group discussion with security policy analysts in Washington, DC. Results of the three general public focus groups are reported here. Results of the elite focus group are presented in Volume II of this report.

Our purpose in conducting focus groups among members of the general public was to informally explore key topics, concepts, and issue relationships among groups of citizens in different geographical regions. We used these discussions to help develop and refine the survey instrument used in our nationwide telephone survey of the general public.

We recorded all focus group discussions on video and audio tapes that were used to produce a verbatim transcript of each session. Two members of the research team separately coded each transcript using complementary techniques and rules but following two distinct coding paths.

- Coding path “A” was top-down, following a traditional hypothetical-deductive process in which we used theory, related hypotheses, and primarily deductive reasoning to code text units in accordance with our analytic framework presented in Chapter One.

- For coding path “B” we employed bottom-up “grounded theory” techniques to code text units based on frequency of occurrence. We then grouped topics and explored relationships among subjects using primarily inductive reasoning.

We entered results from each of these two separate coding paths independently into a software titled QSR NUD*IST 4 (Qualitative Solutions Research: Non-numeric Unstructured Data–Indexing, Searching, and Theorizing, Version 4.0).¹ Our analyses of separate results from each coding path were then combined and reconciled to yield the findings discussed here.

Section 1: Participants

Participants were recruited and facilities were provided by local companies in each city. Recruitment criteria included the following:

- No more than ten participants in each focus group
- Ages 18 and above
- Ethnic representations appropriate to the local areas
- Approximately one-half of each group to be women
- Approximately one-half of each group to have college degrees
- Approximately one-half of each group to have annual household incomes greater than \$40,000
- No persons who had previously participated in any focus group

Our criteria were designed to insure a mix of higher and lower socioeconomic levels, balanced gender mixes, a wide range of ages and experiences, and ethnic diversity generally reflective of local regional populations.

A member of our research team with extensive experience in conducting focus groups moderated each session. Each host facility provided a viewing area where other research team members could observe the discussions without being seen directly by discussants. All focus group participants acknowl-

¹ See Gahan and Hannibal, 1998, for a description of using NUD*IST 4 for qualitative research.

edged in writing that they agreed to the session being recorded, and each received a small stipend for participating.

Boston, Massachusetts, April 13, 1999

Gender	Age	Educa- tion	Name ² and Occupation	Ethnicity	Income (000s)
W	55-64	Col Grd	Judy: retail sales	White	40-80
M	45-54	Col Grd	Rick: high school teacher	Black	40-80
W	35-44	Col Grd	Patricia: nurse	White	> 80
M	35-44	Col Grd	Jim: engineer	White	> 80
W	45-54	Col Grd	Nancy: social worker	Hispanic	> 80
M	55-64	H Sch	Kevin: longshoreman	White	> 80
W	65-74	H Sch	Marilyn: retired	White	< 40
M	25-34	H Sch	Pete: plumber	White	< 40
W	25-34	Col Grd	Cynthia: wholesale	Black	< 40
M	65-74	H Sch	Scott: retired	White	< 40

Dallas, Texas, May 19, 1999

Gender	Age	Educa- tion	Name ³ and Occupation	Ethnicity	Income (000s)
W	44	Col Grd	Margaret: homemaker	White	< 20
W	42	Col Grd	Carol: export coordinator	White	60-80
M	68	Col Grd	Joe: retired	Black	60-80
W	41	Col Grd	Amy: teacher	White	> 80
M	34	H Sch	Dick: train operator	Hispanic	40-60
M	36	H Sch	Brad: mechanic	White	> 80
M	31	H Sch	Arnold: telephone consult.	Black	20-40
W	58	Col Grd	June: medical supply	White	20-40

² Names have been changed to protect the identity of participants.

³ Ibid.

Portland, Oregon, June 3, 1999

Gender	Age	Educa- tion	Name ⁴ and Occupation	Ethnicity	Income (000s)
M	35	H Sch	Carlo: paramedic	Native Am	> 80
M	44	Col Grd	Dan: self-employed artist	White	40-50
W	48	H Sch	Lisa: cook	White	< 20
W	86	< H Sch	Shirley: retired homemaker	Black	< 20
W	49	Col Grd	Beth: adult foster caregiver	Asian	50-60
M	18	H Sch	Dennis: auto mechanic	Mulatto	20-30
W	26	H Sch	Faith: credit reporter	White	40-50
W	55	H Sch	Laura: hospital mail clerk	Black	< 20
M	68	Post Grd	Clint: retired school teacher	White	< 20
M	51	Col Grd	Roy: construction ops. mgr.	White	> 80

Section 2: The Security Environment and Threats to US Security

GIVEN THE RANGE OF VIEWS AND DYNAMICS THAT ARE AT PLAY IN focus group discussions, we can best give the reader a feel for the tone and nature of conversational exchanges in group settings by selectively choosing illustrative passages of actual commentary. The goals of a good group discussion do not include attempting to reach consensus. Rather than generalizing too broadly about shared views, we provide selected commentaries to illustrate differing perspectives without implying that they represent group agreement.

Discussions of the current international security environment were characterized by a sense of uncertainty among some members of all three focus groups as to the predictability of security threats and challenges. Many commented on the difficulty of understanding the sources of new threats and projecting their implications for US security. The following response

⁴ Ibid.

from Rick, a high school teacher in Boston, illustrates frequently expressed sentiment about today's security environment:

Rick: Now you have new players on the stage that bring with them a level of unpredictability. When you dealt with the Russians, you knew who you were dealing with. Now you have these new folks, and they are unpredictable[because] we don't have a whole lot of history with them...what they've done in the past, what they're doing in the present, and what they plan on doing in the future. So as a result of that, you have a lot of chaos...things are very unsettled. Things are moving around right now.

As this quotation illustrates, nearly a decade after the dissolution of the Soviet Union and the end of the Cold War, some focus group participants still had not adjusted to the loss of the simpler organizing framework that characterized the East–West confrontation of the Cold War period. Most evidenced confusion and apprehension about an international environment lacking sufficient organizing principles to help determine friends from potential foes of the US. Some were disconcerted about not being able to predict when and for what reasons the US might choose to employ military force, but most had some appreciation for the value of alternative sources of US influence, such as economic and political power.

When asked whether they considered the US to be more secure or less secure today than it was during the Cold War, opinion was divided, but most participants considered the US to be *less* secure today, largely because of the number and unpredictability of potential threats. Dan, a self-employed artist from Portland put it this way:

Dan: What scares me is that when I was younger, going back, there was the Cold War. The superpowers were kind of locked in this kind of dance, and I don't know how advanced China was with nuclear weapons; Pakistan and India didn't have them. But now that the eastern block has sort of fallen, and that's not the case anymore, what scares me are all the splinter groups and the potential splinter groups, like that Japanese gas poison attack in the subway a few years ago.

Others who considered the US to be less safe today cited concerns about being overextended militarily, about “being the world's police officers and not really worrying about ourselves,” about nuclear proliferation, about vul-

nerability to external and internal terrorism, and about a diffusion of information technologies that reduces US technical advantages and threatens personal privacy.

A few participants disagreed, indicating that the potential for an unrestricted nuclear war with Russia has declined, and some thought that although today's security environment is different, it is not necessarily more dangerous. Clint, a retired elementary school teacher from Portland emphasized positive changes as follows:

Clint: There are different dangers, but I think that there's a shift in consciousness throughout the world, sort of a higher way of thinking. ... I think that there are more democracies starting. I read about lots of places where there are elections, and things seem to be getting straightened out, and dictators are handing power over to elected officials. I think that it's probably a little safer than it was because of this shift in consciousness.

And Patricia, a nurse from Boston, made a somewhat more pragmatic case:

Patricia: I don't think we have anybody that's threatening our borders. We don't have anybody that we have to arm ourselves against. The USSR was our traditional enemy before, but, as you said too, now that it's no longer the USSR, it's all these little countries. ...they're no longer a strong power that can go against us militarily. So I think we're number one. I don't think we have anything to fear from outside at this point.

When asked to identify key threats to US security, participants identified four areas most consistently (order of listing does not imply priority):

- Terrorism involving weapons of mass destruction
- Regional conflicts and rogue state behaviors
- The number and spread of nuclear weapons
- Concerns about the security of information both at the national level and also at the personal level

Terrorism

The potential for terrorism involving nuclear, biological, or chemical components was frequently cited as one of the most dangerous threats to the US. Concerns included both external and internal sources of terrorism. When Dick, a train operator from Dallas, was asked if biological terrorism poses a bigger threat to the US than nuclear weapons, he responded as follows:

Dick: I think it could be. I think it honestly could be. I mean if several of us start falling out dead in the middle of the streets, and nobody knows why, because we didn't see it; we didn't smell it; we didn't taste it, or something of that nature, I think that could be much more detrimental than nuclear weapons.

Roy, a manager in the building industry from Portland, considered terrorism to have supplanted threats from traditional foes.

Roy: I think the threats are terrorism threats. ... The threat from Russia, from Cuba, from other countries that we had feared for a long time isn't there, but it's been replaced by the terrorists, both internal and external terrorists.

Contrary to views expressed in the focus group composed of members of the security policy community and in personal interviews with other policy elites, members of the general public focus groups did not seem to clearly differentiate between potential terrorist attacks that might create domestic havoc, but are not likely to threaten the entire US political and social system, versus external threats of nuclear conflict that conceivably could threaten US survival.

Regional Conflicts and Rogue States

Concerns were expressed about the US being drawn into regional conflicts to restore order among groups with deep-seated animosities. Conflict in the Balkans was sometimes cited as an example of the kinds of regional wars in which the US is becoming increasingly involved. Rick, the high school teacher in Boston, expressed a commonly held view:

Rick: Militarily, I think we may have extended ourselves a little too far. But, you know, part of what America has always stood for is helping the little guy and defending against the world bullies, and I think we've got some good intentions about going over to Kosovo. But we're in a number of places. ...you hate like heck to see people suffer. I mean, I think that we should be involved, but I'm kind of a domestic kind of guy. ... I would like to see the focus come back.

June, a medical supply worker from Dallas, put it this way:

June: I feel like over the last few years that because we have spread ourselves out to so many countries and had the different wars, that it has weakened us militarily. I think we have to do it to keep us safe at home, but I'm not sure. It almost seems like we're being pulled into these little wars. The United States is first; we're out there; we're the ones fighting; and yet I'm not sure.

Kevin, a longshoreman from Boston with family members in the military said:

Kevin: Militarily we have the technology, but we don't have the manpower. Every unit that goes out of here today is short of manpower.

And Dan, an artist in Portland, pointed to the need to restructure US military forces to meet new requirements.

Dan: When I read a lot of the news and saw a lot of the media for the last two years, I thought to myself, we're used to fighting this old fashioned war, huge armies, huge tanks, and we need to gear down more to be like the Israeli commandos. ...two hundred compared to two hundred thousand.

Nuclear Proliferation

Strong consensus existed among all three general public discussion groups that the spread of nuclear weapons is increasing, and that it presents a serious threat to US security. Participants were concerned that nuclear weapons and materials are not being adequately protected in Russia, and that states such as North Korea and Iran are trying to acquire Russian nuclear assets and expertise. They also evidenced concern about Indian and Pakistani nu-

clear tests. Pete, a plumber from Boston, was concerned that nuclear weapons will eventually be employed in combat.

Pete: Someone is bound to use one some day. It's just a matter of time until someone's going to say: "I want to try this; I want to do it."

Cynthia, a wholesaler and fellow member of the Boston focus group, was concerned about Indian and Pakistani leadership.

Cynthia: It's kind of scary when you think who the leaders are in those countries. I don't think the leadership is there. You have all these naïve people who are quick to do irrational things, and that's scary when you have no idea who these people are.

And Jim, an engineer from Boston, thought that national prestige and status were the motivations behind the spread of nuclear weapons.

Jim: It's a national ego thing. Everybody has their own ego and power and wants to make sure that they're heard and get the respect that they think they deserve. ... I think more people just want to wake up and say now I have a big stick too, and they want to be recognized as a power.

Information Security

Several participants were concerned about the security of information at both the national and personal levels. Their remarks were indications of unease with some of the implications of rapidly changing information technologies. Worries about spying and espionage were expressed as follows by Carlo, a paramedic in Portland:

Carlo: ...people are going to other countries and giving up information—a lot of people; for example the military who have top secret or secret clearances, and you've got so many people that have so much information. I don't believe a lot of them are held accountable...and of course it's going to come back to money. I think that there are people out there who see that and manipulate that. They look for the people with information or technology and are willing to put some money out for that, and I believe it falls back on either the government's or the company's responsibility for security.

Carol, an export coordinator from Dallas expressed similar concerns:

Carol: I think it's less secure here, because people here have sold our weapons to the smaller countries, and they are now obtaining the nuclear weapons that we tried to do away with in the treaty, and so now you can't really trust who's selling who what weapons, and who's over here going to some university so they can take information that they can get from the US back to their country and things like that. So I feel like it's really less secure.

Other participants were worried about the security of personal information. Lisa, a cook from Portland expressed her concerns:

Lisa: I think there is a lot of information out there floating around that can't be secured. I think that's a bad thing. ...banking records, personal things, and even tracking people, as far as that goes, with satellites and all the rest of that. It's kind of a scary Big Brother kind of a thing. ...with minor hacking skills you can find out an awful lot about anyone.

Section 3: Relevance of Nuclear Weapons

PERCEPTIONS OF THE CONTINUED RELEVANCE OF NUCLEAR WEAPONS varied widely. While participants expressed near universal aversion to the idea of nuclear war, many also believed that nuclear weapons had helped to deter a nuclear World War III. Most people argued for the continued need for nuclear weapons, although many felt that the size of the US arsenal could be substantially reduced, while others felt that it should be maintained at current levels, and a few participants called for expansion.

When asked about the elimination of nuclear weapons, very few agreed that nuclear abolition would be in the best interests of the United States. Several invoked the continued presence of nuclear weapons in the arsenals of other nations as the primary reason that eliminating all nuclear weapons was not feasible in the foreseeable future. In general, they believed that widespread availability of nuclear technology made nuclear abolition very unlikely.

We invited participants to comment on nuclear deterrence along three lines of inquiry:

- Their understanding of the concept of deterrence
- Their impressions of whether it worked during the Cold War
- Their views about the relevance of nuclear deterrence today

Defining Nuclear Deterrence

Defining nuclear deterrence proved challenging for many participants who found it to be an ambiguous concept that they could not clearly articulate. Some individuals expressed an understanding that was conceptually correct. Others had only a vague or partial understanding of the concept. The following comment from Dan, a Portland artist, illustrates a basic understanding of the core principle, but also a lack of confidence about the meaning that was not uncommon among other participants.

Dan: I'm not totally clear on it either. I couldn't say I thoroughly understand it or [have] read anything in the newspaper where I am totally clear. ... I think the concept is that it's defensive. I'll never use this against you, unprovoked, but I've got it and you have to know [that] it's pretty horrible. If you ever do anything to me...then I can use it. And that [is] deterrence.

Nancy, a social worker from Boston, expressed the following understanding of extended deterrence:

Nancy: It's like they got together and between them they said, well, the United States is a big country and they have all the power, so other little countries will come under the United States umbrella to protect them from countries like China.

Role of Deterrence During the Cold War

Some participants had a clear opinion about the role of nuclear deterrence during the Cold War. For example, Rick, a high school teacher from Boston, inferred the connection between deterrence and the prevention of catastrophic nuclear war.

Rick: Deterrence to me was if other countries knew that you had the capability, the firepower to start a war or to retaliate...you kind of kept folks,

other countries, in check. Other countries would say, gee, if I start something with the United States, then I'm going to catch hell on the other side. I think one of the things that kept Russia and the United States going back and forth was the fact that they knew that both of them had the capabilities of attacking and counter-attacking, but they also knew that the earth as we know it would be destroyed. I guess both sides kept each other in check.

When asked whether he believed that nuclear deterrence helped to prevent war between the US and the Soviet Union during the Cold War, Brad, a thirty-six-year-old mechanic from Dallas, stated the following:

Brad: I think so; I believe it. I think it was probably the most important thing that contributed [to prevention of war]. Neither country wanted to be annihilated or have millions or billions of people killed.

Arnold, a telephone consultant from Dallas, agreed:

Arnold: Yes,...I think [nuclear deterrence] did keep...World War III from happening during the Cold War.

And Rick, the Boston teacher, credited nuclear deterrence with making obsolete large-scale wars of the past.

Rick: You don't see the type of war anymore like a World War I or World War II, because it's just so costly now that some folks have the bomb or hydrogen bomb or whatever bomb they're going to use.

Some qualified their ideas concerning the efficacy of deterrence with a belief that the United States essentially outspent the Soviet Union. For Roy, a construction operations manager in Portland, it was this spending/building dynamic, rather than nuclear deterrence that advanced the security goals of the United States during the Cold War.

Roy: Well, wasn't that what stopped Russia though? Didn't we basically bankrupt them by building more? You know, them trying to keep up with our nuclear arms race. Eventually they were no longer able to do that.

Relevance of Nuclear Deterrence Today

When asked whether nuclear deterrence was still a relevant concept, most participants agreed that it remains a key element of today's security environment. Patricia, a nurse in Boston, expressed her continuing valuation of nuclear weapons for deterrence purposes by saying:

Patricia: I think it is a deterrent; I really and truly think that if we both have big sticks, then nobody's going to use it first, because nobody wants to get smashed.

In Portland, Lisa, a cook, and Roy, a construction operations manager, had this exchange about the continuing value of nuclear deterrence:

Lisa: Any country that can use it knows it can be used against them. I think the fact that they just have it is a good deterrent.

Roy: Yes, and I think that it stops or it prevents them from doing things that they might have done without a deterrent. If they wanted to march into some other country and take over that country, without a deterrent they could do it.

Brad, a mechanic in Dallas, tied the relevance of nuclear deterrence to his concern about the spread of nuclear weapons.

Brad: With the more people there are out there selling this knowledge to other countries who may be ruled by dictators and have people who are actually terrorists running the country, I think it's important to have deterrence against that.

In Boston, although Rick thought that nuclear deterrence probably helped to prevent a third world war, he clearly associated it with an earlier era.

Rick: In the sense that [nuclear deterrence] kept people from getting involved in a worldwide war, I guess yes it did. But deterrence is like a fifties or sixties thing.

Section 4: Nuclear Force Structure and Posture

Discussions about US nuclear weapons and current force posture dealt primarily with three issues introduced by the moderator:

- The potential for eliminating all nuclear weapons
- The size and posture of US nuclear forces
- Assumptions about strategic missile defenses

Eliminating Nuclear Weapons

Exchanges about the potential for world-wide nuclear abolition were characterized by conflicting views about desirability versus feasibility. The following exchange among members of the Boston focus group is illustrative:

Pete: If you could take the whole world and, for sure, you know everyone's going to get rid of them, that would be nice. It would be a really nice place, but you can't. They're going to say, "oh yes, they're all gone," but they're going to hide a few of them. ...it's too bad you couldn't sit everyone down in a room and just discuss it and say: "listen, it's just not going to get us anywhere." That's not how the human race works though.

Nancy: It would be the same thing Saddam is doing. He hides stuff; he moves them around in different places so when the UN goes in to inspect, they look and don't find anything. Other countries will do the same.

Cynthia: I think wanting to use them and keeping them are two different things. You obviously don't want to see them used, but you do want to keep them as a safety net to fall back on if you do need them. If I had to vote on getting rid of them today, I would have to vote against it.

Pete: If we could guarantee everyone would get rid of them, it would be nice, but you can't. Too many people are lying.

Patricia: If the bigger powers would disarm, somebody else would pop up with nuclear weapons. I think it's just safety; it's like money in the bank.

Skepticism also was expressed in Dallas:

Carol: I don't think they'll ever get rid of nuclear weapons. They'll always have them on the back burner.

Brad: I'd be afraid that would make us less secure without the nuclear weapons against other countries that are working on getting them right now.

Arnold: ...if conventional methods were going to replace or deter nuclear war, I think there would have to be a world-wide agreement that says none of us will have nuclear weapons in war, and that's not going to happen.

Joe: They can't get rid of guns; how could they expect to get rid of nuclear weapons?

Views were more mixed in Portland, but they illustrated the degree to which some Americans have become acculturated to living with nuclear weapons:

Lisa: If we were the first country to stand up and say they're not here, would people applaud, or would they say now you're weak and small?

Dan: ...I think no weapons at all. I don't know what anybody could do to us at this point if we stood up and said we're going to get rid of all our nuclear weapons, a hundred percent. If I really kind of follow that logical thought, I can't envision that somebody's going to say: "Aha, this is our opportunity." For God's sake, they'd do anything to get American products in all parts of the world. ... I just can't really see that we'd be any more vulnerable without them. Because of the type of war and the types of dangers and oppositions, we're probably more at risk economically; everybody's fighting economic wars.

Faith: Yes, but what happens the first time somebody shakes a fist at you? I must say that I've never known a time when someone didn't. I've never know a time when there wasn't always the assumption that somebody could drop some kind of bomb any day. I wouldn't know how to face life if we didn't have any weapons. I wouldn't know how safe it would feel. All I can see is that it would be something very, very different and scary, because I just assume that the very second we said that we have none, then two things are likely. Somebody would say: "I've got one; you do this, or I'm going to use it on you, because you don't have

anything to fire back.” And then the other thing is, if we said that we didn’t have any nuclear weapons, what makes anybody think that there wouldn’t be this vast source of biologicals which is the number one thing that frightens me. I’m used to the nuclear weapon thing, but just because we said we have no nuclear weapons, doesn’t mean we can’t also have exactly the same threat in biologicals.

Size and Posture of US Nuclear Forces

Most participants did not have well developed views about how many nuclear weapons the US should maintain. Most were unwilling for the US to unilaterally disarm, and a good deal of skepticism was voiced about verifying mutually agreed reductions. Nevertheless, some participants voiced support for cooperatively lowering overall numbers of nuclear weapons, while others were cautious about reducing to very low levels.

In Boston, Pete was not concerned about numbers, but Patricia and Scott wanted to insure the US retains a nuclear arsenal of sufficient size:

Pete: ...if they use them, we’re all gone anyway, so what’s the difference whether it’s fifty or 50,000. ...they can only aim so many places in the world, I guess.

Patricia: I’m very, very cynical, and I want us to have enough and a little extra. ...that’s human nature; people fight. I think human life is valued differently in different places. And if we want to keep it the way we want it for us, and perhaps spread [our values] in other countries, then we need to have power.

Scott: We should have at least one more than the other guy. One more, and if there are ten other guys, we should have ten more.

The views of Mary and Brad in Dallas were typical of the cautious approach:

Mary: I would think that you have to come up with some kind of a number that would be lower, but would still give some assurance for national security, because if you go down to one, and that’s not enough if the situation calls for it, well then obviously that’s not a good number.

Brad: I don't have an exact number, but I think we should keep enough to protect ourselves against the countries that have nuclear capabilities and are against the US right now, and those that we anticipate being in the future, and we should keep enough for all those countries that would be a threat to the US.

In Portland, Faith put it this way:

Faith: I think if you had just enough to cause serious damage—you wouldn't have to go as high as 50,000 or whatever—but if you had just enough to really be able to have the threat of obliterating whoever it's going to be, no matter how big the country or their allies, then that's probably a good place to stop. Because then, if other countries that you don't know about have all their weapons, at least you'd know you had enough.

These and related discussions about numbers of nuclear weapons implied that many participants were not prepared to argue for specific nuclear force levels, but the issue of numbers of nuclear weapons and the issue of nuclear abolition were viewed as being qualitatively different. Views about numbers of nuclear weapons appeared to be malleable, while views about eliminating all nuclear weapons were much more fixed.

When the discussion turned to force posture issues such as de-targeting and de-alerting, participants were not well informed about the distinctions or associated advantages and disadvantages. Discussions were impressionistic and required explanations of the concepts. The following introduction of de-alerting by the moderator and the ensuing exchange among Dallas focus group members illustrates group caution.

Moderator: De-alerting refers to disassembling, taking warheads off of missiles, off of bombs, off of cruise missiles, so that you've got the warheads stored, and you've got the missiles or delivery vehicles stored somewhere else. Some people argue that we should change our alert posture by de-alerting, and they say that we should do that because it reduces the chance for an inadvertent launch or an accident. They believe that it's safer to de-alert. How does this notion strike you?

Dick: A loaded gun or an unloaded one, right? The bullets are over here and the gun is over there.

Moderator: That's exactly right. The argument is that we should do that, and we should negotiate with China and Russia to get them to do that.

Amy: No.

Carol: No, because you can't trust anyone, and I want that nuclear weapon there.

Amy: There's a chance of an accident, but it hasn't happened in all these years, so if we need it, it has to be ready.

The following exchange about de-targeting and de-alerting occurred in Portland and illustrated the group's mixed feelings:

Moderator: If you're thinking about somebody else's missiles targeted at the US, those in China or those that are in Russia, with all the turbulence that's going on over there, does it make you feel safer to think that they have de-targeted their weapons so that they're not aimed at Chicago and Portland and other major US cities?

Laura: But how do we know that?

Moderator: That's a really good question; we don't.

Laura: So why do we want to disable ours when we really don't know whether they've disabled theirs? I mean, that's something to think about first, before you even go into de-targeting.

Moderator: There's another step that you could take and that is to physically separate the warhead, the nuclear weapon component, from the delivery vehicle, and you could put them in separate places. This is called de-alerting a weapon as opposed to de-targeting, which is just re-programming. [De-alerting means] removing critical components so that the possibility of an accidental or an unauthorized launch of a nuclear weapon is reduced.

Faith: I'd be real tempted to leave some weapons armed, just because I'm not a very trusting person.

Dan: If the goal was just to make a safer world based on the concept of nuclear weapons, I would say, by all means, de-alert and de-target both. Because I don't really think it's that critical an issue at this juncture.

National Missile Defenses

A large majority of participants were unaware that the US does not now have defense systems that are capable of shooting down ballistic missiles in flight. Some were so sure about such a system that when they were told that it does not now exist, they challenged the moderator. Most had inferred from televised videos of the Persian Gulf War, showing Patriot missiles being fired against Iraqi SCUDs, that the US possesses effective strategic missile defense systems. Misperceptions are illustrated in the following exchanges in Dallas and in Portland.⁵

Moderator (Dallas): You probably have heard about the Strategic Defense Initiative, often termed "Star Wars" by the media during the Reagan years. It was an effort to develop a defense system against other people's ballistic missiles launched at the US. Do you know if we ever built that system?

Joe: I think that's pretty much in place.

Carol: Yes.

Brad: I never heard that it was in place.

Arnold: I never heard; I knew they were starting on it.

Moderator (Dallas): Actually we don't. ...we do not have a national system that would be able to shoot down intercontinental ballistic missiles launched at the United States.

Carol: Well I thought it was already in place, so I am shocked.

⁵ Focus group misperceptions were substantiated by our subsequent national survey of the US general public. As reported in Chapter Four, sixty-three percent of respondents thought that the US had an operational defensive system for shooting down long-range ballistic missiles that have been launched against the US homeland.

Joe: Me too. I'd really like to challenge you on that to see where you get your information from.

Moderator (Portland): Is it your impression that the US has a defense against missiles that could be fired by somebody else into the United States today?

Clint: I would suppose that they have something that would, or some kind of defense. It may not be completely one hundred percent.

Lisa: I would think so. I can't imagine that we wouldn't have defenses against ICBMs or whatever. What is the point of the satellites and all the learning, the knowledge of where the storage sites are, where they're stored? What purpose does that serve if we don't have a way to defend [ourselves]? It doesn't make sense to me, so I would assume that we do have a defense, but I'm sure not that well informed.

Laura: I think we do.

Dan: I think the government would like us to think they do, and I don't think we do.

Dennis: Why spend five trillion dollars on some weapons to blow up somebody; we should have something to protect ourselves.

Lisa: You would think; you would think.

Section 5: Security Policy Processes and the Public

Discussions about the role of the general public in security policy process centered around three aspects.

- Did participants think they had the capacity to constructively contribute to the evolution of nuclear security policy (internal political efficacy)?
- If they tried to participate, would the security policy process allow them to have a role (external political efficacy)?

- What were their preferences about public participation in security policy processes?

Internal Political Efficacy

Internal efficacy is an indication of the degree to which participants think they have the individual abilities to contribute to political and policy processes. Some participants were not at all confident in their ability to make informed judgments about nuclear security issues. Dan, an artist in Portland, expressed confusion over the streams of information vying for his attention.

Dan: I'm a firm believer that our opinions, my opinions, are shaped by what I hear on the radio, on the TV, watching movies, watching television. ... My real concern is my kids. Like you said, when your son is sick or your daughter, nothing else matters, including the government. The things that matter to me are my checkbook, and whether my plumbing works. So this really important stuff flows through all these different sources. Who really knows clearly? How am I supposed to affect my representative when I'm getting this twisted, bizarre stream of information from every corner of my life? You know, it all becomes just a mess.

When asked whether they thought they could influence policy, the following exchange took place in Boston between Kevin, a longshoreman, and Pete, a plumber.

Kevin: ...[nuclear security issues are] in military hands because they know exactly what they're doing about those things. Pete as a plumber, me as an electrician, we can't sit down and tell them what the hell they're going to do with nuclear warheads. We don't know nothing about it.

Moderator: So, is it appropriately left in the hands of the military and political leadership?

Pete: We hope; we just hope they make the right decisions. I mean, like Kevin just said, they're the professionals at what they do, so if they make the right decision and are just not too headstrong. Some of them people don't live in reality. Now they think they are reality, and they can do what they want, but we, us people, we have to live by their rules, but they don't have to live by their rules, so it can be scary.

When asked whether he could influence security policies, Scott, a retired telephone industry worker in Boston commented as follows:

Scott: I don't know, because we don't know the whole story, the whole background. ... One of the reasons we have the Joint Chiefs of Staff...is to make these decisions. Like they say, I am a telephone worker, I don't know. [If] they say it takes "x" amount of time to get this thing ready and do this or do that, we have to rely on that group of people.

But Faith, a credit reporter in Portland, was indignant that we would even question whether the public is able to participate in decisions about nuclear security issues.

Faith: Just the idea that [you] people are even asking me if the general population is ready to talk about something! Of course I'm ready to talk about something. I mean, we're not all as stupid as apparently they think we all are.

And Lisa, a Portland cook, was concerned that she was not getting adequate information from the media.

Lisa: The average newspaper is written so a twelve year old can understand it. It's really not written for adults; it's written for children with an eighth grade education, because we have so many illiterate people. How technical can they get? How informed are you, really, by a newspaper? ... We think we know what the threat is, but do we really?

External Political Efficacy

External efficacy relates to perceptions about the degree to which the political system and security policy processes can be influenced by citizens. When asked whether the public has any influence in nuclear policy matters, most participants doubted that they had much influence during the Cold War or today. Cynthia, a college graduate and wholesaler from Boston, expressed her doubts this way.

Cynthia: I think public opinion has very little weight.... When you think about it, how much interest do you really have when it comes to stuff

like that. And you don't [have much influence] most of the time about the decisions that are made. You don't have to agree with them, and yet you can't really change anything. So what percentage of input is valued and used toward making decisions?

When the group in Dallas was asked whether they felt as if they had an adequate voice in shaping security policy, the following exchange took place between Amy, a teacher, and Joe, a retiree.

Amy: ...those decisions are made by elected officials, politicians, and a lot of those issues are not brought up [when they are] making those decisions.

Joe: They're controlled by lobbyists. They don't care what the people say.

Amy: And some that they think may not be well accepted are not even brought up until later, so, no, I don't think we do.

When told that one estimate from outside government suggests that the US may have cumulatively invested more than five trillion dollars for nuclear weapons related capabilities, Roy, a construction manager in Portland, expressed his frustration with the arms race of the Cold War and his view that the public has had little influence on such decisions.

Roy: ...the military kept this mushrooming budget that we had to have more and more. They had enough; they had enough at *one* trillion dollars worth of nuclear arms, but it kept their power, kept their people working, kept the munitions going. So, it meant they had more power. I don't think the public had any effect at all on how much was spent on nuclear weapons.

Later Roy expressed continuing doubts about the public's ability to shape security practices, including reductions in the nuclear stockpile.

Roy: ...the military has control of all of these, correct? They've got the power; they probably want to maintain the status quo. ... And then you've got the people that want to dismantle [nuclear weapons] and there are vested interests there, because there's a lot of money involved in dismantlement. There's a lot of money to be made there. So, are we going to get the straight scoop from that side?

Also in Portland, Lisa expressed doubt that elected officials can be counted on to meet the needs of the people.

Lisa: I know our government has a habit of speaking for all of us...but they're not always right. In fact, they're wrong a lot, and I'm not sure that we can control our elected officials and count on them to stand by the needs of the people. I think that would be the ultimate thing to do. But I think we're talking about a perfect world, and I think that's kind of a utopian sense of well-being that we expect these people that were elected to do what we elected them to do. I just don't think that happens.

But participants in Boston also expressed their confidence that they can express their views on any policy issue they wish to influence without fear of reprisal. The following exchange took place between Patricia, a nurse, and Pete, a plumber.

Patricia: But you see, here in this country they don't shoot us for getting together and organizing, so it's not a personal safety issue. In other countries, you can't do this. If they got together, they got shot. ... But the government is not going to kill us for making our views known, and I think that's a very good form of personal protection, because that enables us to make our views known. I don't know if anyone else has a fear [of speaking out about security issues].

Pete: Not in this country; well, I mean I don't think they're going to run us over with tanks if you go to downtown Boston with some picket signs.

Preferences About Public Participation

Our final dimension of public views has to do with the kinds of preferences that participants expressed for the public's role in security policy evolution. Generally, participants indicated that they would welcome more openness and debate, and that they would like to see security policy issues figure more prominently in elections. The following exchange in Portland between Faith, a credit reporter, and Clint, a retired school teacher, represents a widely shared view that public debate is important.

Faith: I think that debate is good, always, and that you should let more people into it, and then make a smart decision. A bunch of people getting

together does not always make the smartest one, but at least give the people a way to get together to talk about these things, actually listen [to them], and then do what you think is best. But allow the people to know as much as it's safe to know.

Clint: Not just in this country, but people all over the world need to know that they should speak up, learn what they can, and influence their leaders as much as possible. And I think that's happening because of the Internet, that sort of thing. People are getting information that they ordinarily would not have gotten. Some of it may be bogus, but at least they access more information and talk to one another.

Patricia, a nurse in Boston, supported greater public advocacy.

Patricia: But the thing that I feel strongly about...is that we get together locally. Okay, we want more aides in the classroom, and a bunch of us get together; we call our elected officials; we put up posters; we do this, we do that; then we have our voices heard. ... We have a lot of power, ...all we have to do is get together and use it, and decide what we want to use it on so that we can become a political force.... So, I think if it means a lot, people will do it.

The following exchange in Dallas illustrated contrasting views about the advisability of more public debate about security issues.

Moderator: Now the Cold War is over, and we have decisions to make about how to restructure US security policy. And I'm trying to get an idea of whether you expect to be consulted on this, and whether you expect these issues to be in political campaigns and to be debated more openly than they were during the Cold War.

Dick: No.

June: I think that if we did that, we would weaken our national security.

Dick: Spies; you have spies.

June: If everyone knows what's going on, we wouldn't have any security.

Carol: I think there's too many chiefs and not enough Indians.

Brad: The public is not going to know how strong another country's [military] forces are as much as somebody who has expertise in that area.

Arnold: ...it doesn't bother me to make [security issues] more a part of the political agendas for candidates. I think they need to.

Carol: I'd like to know a little bit about where they stand on these [issues].

Arnold: Right; I would love to. If you've got to push the button, I want to know we can do it....

Our final example is an exchange in Portland between Clint and Faith that expressed their preferences for opening up the security debate not only among US citizens but elsewhere as well.

Clint: ...if we set the example of opening it up to the public, maybe other countries would say that, well, yes, we should have it open to us too, and they might pressure their governments to open up so that they can speak more freely too.

Faith: Then there are things that obviously you couldn't share, like maybe exactly where [nuclear weapons] are, exactly who has the keys, and where their pressure points are, ...but there is nothing wrong with asking people about the funding. There's nothing wrong with asking people their opinions about things.

Generally, participants welcomed more information about security issues, wanted to hear more debate about security among political officials and candidates, and thought that members of the general public should take a greater role in helping shape US security policy, including nuclear weapons issues.

Volume I: Appendix 3

Questions, Distributions, and Means

We want to begin by asking you some questions about how you think the world may have changed since the end of the Cold War. We are interested in your perceptions. There are no right or wrong answers.

Q1/Natsec Considering the international environment as a whole, and using a scale where one means the world is *much less secure*, and seven means the world is *much more secure*, how do you think that *international security* has changed since the end of the cold war?

	MUCH LESS SECURE			NO CHANGE		MUCH MORE SECURE		MEAN	
	%	1	2	3	4	5	6		7
Pub 99		7	7	19	21	29	9	7	4.1
Pub 97		8	6	15	19	34	10	9	4.3
Sci 97		1	7	11	9	37	31	4	4.8
Leg 97		2	11	17	9	33	24	5	4.5

('97: P1-1/Natsec)

[99-97: p = .0057]

Q2/USsec Now focusing more specifically on the US, and using the same one to seven scale, where one means *much less secure*, and seven means *much more secure*, how has *US security* changed since the end of the cold war?

	MUCH LESS SECURE			NO CHANGE		MUCH MORE SECURE		MEAN	
	%	1	2	3	4	5	6		7
Pub 99		7	9	16	18	26	14	10	4.3
Pub 97		8	8	14	19	26	15	11	4.4
Sci 97		1	5	15	12	27	32	8	4.9
Leg 97		3	10	23	9	25	23	6	4.4

('97: P1-2/USsec)

[99-97: p = .3805]

Q3/USwar Turning now to nuclear considerations, on a one to seven scale where one means the chances have *decreased greatly*, and seven means the chances have *increased greatly*, how has the breakup of the Soviet Union affected the chances that the *US* will be involved in a war with *any country* in which nuclear weapons are used?

	DECREASED GREATLY			NO CHANGE		INCREASED GREATLY		MEAN	
	%	1	2	3	4	5	6		7
Pub 99		7	8	17	16	24	14	13	4.3
Pub 97		10	13	19	16	18	13	12	4.0
Pub 95		14	11	16	15	19	9	16	4.1
Pub 93		11	16	18	15	19	10	11	3.9
Sci 97		6	30	28	13	15	6	1	3.2
Leg 97		6	22	26	17	21	7	2	3.5
UCS 93		10	23	21	19	16	8	3	3.4
Labs 93		3	13	15	19	30	16	4	4.2

('93: USWAR-22) ('95: B19/USwar) ('97: P1-3/USwar)

[99-97: p <.0001; 99-93: p <.0001]

Q4/Nucwar Using the same scale from one to seven, how do you think the breakup of the Soviet Union has affected the possibility that nuclear weapons will be used by *any* country against *any* other country?

%	DECREASED GREATLY			NO CHANGE			INCREASED GREATLY		MEAN
	1	2	3	4	5	6	7		
Pub 99	6	6	13	18	22	19	17	4.7	
Pub 97	7	9	15	17	21	16	14	4.4	
Pub 95	8	7	12	14	22	13	23	4.7	
Pub 93	6	8	14	18	22	14	18	4.5	
Sci 97	2	11	21	20	28	15	3	4.2	
Leg 97	3	11	20	19	28	15	4	4.2	
UCS 93	3	7	13	21	27	21	8	4.6	
Labs 93	1	3	7	17	31	30	12	5.1	

('93: NUCWAR-23) ('95: B20/Nucwar) ('97: P1-4/Nucwar) [99-97: p = .0001; 99-93: p = .0644]

The next several questions ask for your perceptions about risks to American society associated with managing *US* nuclear weapons. Using a scale from zero to ten where zero means *no risk*, and ten means *extreme risk*, how would you rate the risk of each of the following items:

Q5/Manu Manufacturing nuclear weapons in the US?

%	No Risk										EXTREME RISK		MEAN
	0	1	2	3	4	5	6	7	8	9	10		
Pub 99	3	3	8	9	10	22	9	12	10	3	10	5.4	
Pub 97	5	5	9	10	10	19	9	11	8	2	10	5.1	
Pub 95	4	2	4	5	5	13	6	11	13	6	31	6.9	
Pub 93	3	3	6	6	6	14	8	11	13	8	22	6.5	
Sci 97	2	12	17	17	8	14	9	10	6	3	2	4.1	
Leg 97	2	10	19	15	12	14	9	9	6	2	3	4.2	
UCS 93	0	2	5	8	5	7	8	13	15	13	24	7.1	
Labs 93	2	20	21	18	10	10	6	6	3	2	2	3.4	

('93: MANU-5) ('95: B3/Manu) ('97: P1-5/Manu) [99-97: p = .0012; 99-93: p <.0001]

Q6/Trans Transporting nuclear weapons in the US?

%	No Risk										EXTREME RISK		MEAN
	0	1	2	3	4	5	6	7	8	9	10		
Pub 99	3	4	8	10	7	18	11	14	9	4	12	5.7	
Pub 97	4	5	8	11	9	17	9	12	11	4	11	5.4	
Pub 95	3	2	3	4	4	12	5	10	13	9	34	7.2	
Pub 93	2	2	5	5	6	13	8	13	15	7	25	6.8	
Sci 97	2	13	15	16	7	13	12	10	5	3	2	4.2	
Leg 97	2	9	18	13	10	11	12	12	6	2	3	4.5	
UCS 93	0	3	6	9	6	11	10	12	13	12	18	6.6	
Labs 93	3	21	22	17	9	8	6	7	3	1	2	3.3	

('93: TRANS-6) ('95: B4/Trans) ('97: P1-6/Trans) [99-97: p = .0115; 99-93: p <.0001]

Q7/Store Storing existing nuclear weapons in the US?

	%	<u>No Risk</u>										<u>EXTREME RISK</u>	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		2	4	6	8	8	17	10	14	11	5	15	5.9
Pub 97		4	4	8	9	8	15	9	13	11	5	14	5.7
Pub 95		3	2	4	5	4	13	6	11	12	8	30	6.9
Pub 93		2	2	5	7	7	13	9	11	13	7	23	6.6
Sci 97		2	14	17	14	7	13	12	9	6	3	2	4.2
Leg 97		2	13	15	13	11	13	10	12	6	3	3	4.4
UCS 93		1	3	8	8	7	10	10	12	16	8	16	6.3
Labs 93		5	27	21	16	8	8	5	5	2	1	1	3.0

('93: STORE-7) ('95: B5/Store) ('97: P1-7/Store)

[99-97: p = .0286; 99-93: p <.0001]

Q8/Dsmbl Disassembling nuclear weapons in the US?

	%	<u>No Risk</u>										<u>EXTREME RISK</u>	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		3	5	8	11	11	18	10	12	7	5	10	5.3
Pub 97		5	6	10	10	11	19	9	10	8	3	10	5.1
Pub 95		4	3	5	7	6	14	7	9	12	6	26	6.5
Pub 93		4	3	7	8	8	17	7	10	14	6	17	6.0
Sci 97		3	16	18	17	10	13	9	8	4	2	1	3.7
Leg 97		2	13	18	14	12	13	11	8	4	2	3	4.0
UCS 93		1	5	13	14	9	12	10	9	14	5	7	5.2
Labs 93		2	17	23	20	13	9	6	5	3	1	0	3.3

('93: DSMBL-8) ('95: B6/Dsmbl) ('97: P1-8/Dsmbl)

[99-97: p = .0059; 99-93: p <.0001]

Q9/Rwaste Storing radioactive materials in the US from disassembled weapons?

	%	<u>No Risk</u>										<u>EXTREME RISK</u>	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		2	3	4	7	8	15	11	13	11	8	19	6.4
Pub 97		3	3	5	7	8	14	9	15	11	6	17	6.1
Pub 95		3	2	3	5	4	10	5	10	15	9	36	7.4
Pub 93		2	1	2	3	4	9	7	10	18	11	34	7.6
Sci 97		2	12	15	16	8	12	10	12	8	4	2	4.4
Leg 97		2	10	14	13	7	13	12	11	9	5	5	4.9
UCS 93		0	3	6	7	5	10	10	10	17	13	21	6.9
Labs 93		3	16	18	16	12	11	7	7	5	2	2	3.8

('93: RWASTE-9) ('95: B7/Rwaste) ('97: P1-9/Rwaste)

[99-97: p = .0077; 99-93: p <.0001]

Q10/Unauth Some people worry that a nuclear weapon might someday be used by US forces without the president's authorization. On a scale from zero to ten, where zero means *not at all likely*, and ten means *highly likely*, how would you rate the likelihood of a *US* nuclear weapon being used within the next 25 years without presidential authorization?

		NOT AT ALL LIKELY										HIGHLY LIKELY	
%		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99	15	12	12	11	6	11	5	7	9	4	9	4.2
Pub	97	17	13	14	10	5	12	4	7	7	3	9	3.9
Pub	95	15	11	8	7	5	16	5	8	8	2	15	4.7
Pub	93	15	13	11	12	6	14	4	6	8	2	10	4.1
Sci	97	16	34	20	13	4	6	3	2	2	1	0	2.1
Leg	97	17	27	21	15	5	7	3	3	2	1	1	2.3
UCS	93	7	21	17	15	5	10	6	5	6	2	4	3.6
Labs	93	20	38	19	9	3	3	1	3	2	1	1	1.9

('93: UNAUTH-20) ('95: B17/Unauth) ('97: P1-10/Unauth) [99-97: p = .0062; 99-93: p = .1560]

Q11/Explode Some people are concerned about the possibility of an accidental explosion of a nuclear weapon. On the same scale from zero to ten, how would you rate the likelihood of an accident involving a *US* nuclear weapon causing an unintended nuclear explosion?

		NOT AT ALL LIKELY										HIGHLY LIKELY	
%		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99	7	8	11	12	8	16	7	10	9	3	8	4.7
Pub	97	7	11	13	10	8	14	8	9	8	3	9	4.6
Pub	95	6	8	8	10	8	19	6	10	9	3	13	5.2
Pub	93	5	10	12	11	8	18	8	9	7	3	10	4.8
Sci	97	11	33	21	13	6	6	4	3	2	1	0	2.4
Leg	97	9	20	22	18	7	8	6	5	3	1	1	3.0
UCS	93	4	14	17	16	6	9	8	7	7	4	6	4.2
Labs	93	24	37	18	9	3	4	2	2	1	1	0	1.7

('93: EXPLODE-21) ('95: B18/Explode) ('97: P1-11/Explode) [99-97: p = .2271; 99-93: p = .4236]

Q12/Nsprd On a zero to ten scale where zero means the likelihood for the future spread of nuclear weapons is *greatly reduced* and ten means it is *greatly increased*, how do you think the breakup of the Soviet Union has affected the likelihood that nuclear weapons will spread to other countries?

		GREATLY REDUCED										GREATLY INCREASED	
%		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99	1	1	3	6	6	17	11	16	15	8	16	6.6
Pub	97	3	2	4	8	8	19	10	14	13	5	13	6.0
Pub	95	2	4	4	8	9	18	9	16	10	4	16	6.0
Pub	93	7	6	0	10	0	13	20	0	17	0	26	6.4
Sci	97	1	1	4	6	7	14	17	22	17	8	4	6.3
Leg	97	0	1	6	6	9	17	17	18	13	6	7	6.0
UCS	93	1	1	2	3	4	12	11	18	21	11	15	7.0
Labs	93	0	0	1	2	1	6	8	19	23	19	21	7.9

('93: NSPRD-37) (B22/Nsprd) ('97: P1-12/Nsprd) [99-97: p <.0001; 99-93: p = .2128]

Q13/USrisk How do you think the spread of nuclear weapons to other countries influences the security of the US? On a zero to ten scale where zero means the spread of nuclear weapons poses *no risk* to the US, and ten means the spread of nuclear weapons poses *extreme risk*, how would you rate the risk to the US if more countries have nuclear weapons?

	No Risk											EXTREME RISK	
	%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99	1	1	1	3	3	8	9	15	22	12	26	7.6	
Pub 97	1	1	1	3	5	10	8	15	18	11	27	7.4	
Pub 95	1	1	1	2	4	10	9	15	18	8	32	7.7	
Pub 93	1	0	2	3	3	9	9	16	18	8	32	7.6	
Sci 97	0	1	3	6	4	8	15	23	22	11	6	6.7	
Leg 97	0	0	3	4	3	8	14	21	24	11	12	7.1	
UCS 93	1	1	2	3	2	5	11	18	24	15	18	7.5	
Labs 93	1	0	1	1	1	5	8	17	27	20	20	7.9	

('93: USRSK-38) (B23/USrisk) ('97: P1-13/Usrisk)

[99-97: p = .0187; 99-93: p = .9951]

Q14/Ternow Shifting now to the possibility of nuclear weapons being used by terrorists, what are your perceptions of today's threat of nuclear terrorism? On a zero to ten scale where zero means there is *no threat* of nuclear weapons being used by terrorists, and ten means there is *extreme threat*, how would you rate *today's* threat of nuclear terrorism occurring anywhere in the world?

	NO THREAT											EXTREME THREAT	
	%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99	1	1	2	4	6	11	10	14	18	11	22	7.1	
Pub 97	2	1	3	5	6	12	10	13	17	10	22	7.0	
Pub 95	1	1	2	3	5	13	9	13	17	9	27	7.3	
Pub 93	1	2	3	5	6	13	10	14	18	6	22	6.9	
Sci 97	0	4	7	11	8	10	14	18	17	8	4	5.8	
Leg 97	0	1	5	6	6	10	16	23	17	10	6	6.5	
UCS 93	1	7	9	9	4	10	14	18	14	7	6	5.7	
Labs 93	0	4	9	8	5	10	15	19	17	9	5	6.0	

('93: TERNOW-43) ('95: B24/Ternow) ('97: P1-14/Ternow)

[99-97: p = .2513; 99-93: p = .0075]

Q15/Tenysrs On the same scale where zero means *no threat*, and ten means *extreme threat*, how would you rate the threat of nuclear weapons being used by terrorists anywhere in the world during the *next ten years*?

	NO THREAT											EXTREME THREAT	
	%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99	1	1	3	5	4	11	10	17	18	9	21	7.1	
Pub 97	2	1	4	4	7	13	10	15	16	8	21	6.8	
Pub 95	1	1	3	4	5	12	9	15	14	7	28	7.2	
Pub 93	0	1	3	5	5	15	9	16	17	6	23	7.0	
Sci 97	0	3	5	9	8	11	14	16	18	10	6	6.2	
Leg 97	0	2	4	6	6	8	16	19	18	11	10	6.6	
UCS 93	1	2	5	7	5	7	11	16	17	16	14	6.8	
Labs 93	0	1	3	5	3	6	8	18	21	19	15	7.3	

('93: TENYRS-44) ('95: B25/Tenysrs) ('97: P1-15/Tenysrs)

[99-97: p = .0057; 99-93: p = .3297]

Q16/Influ Next we turn to broad issues of US leadership. The next four questions use a zero to ten scale where zero means *not at all important*, and ten means *extremely important*. First, how important are US nuclear weapons for US influence over international events?

	%	NOT AT ALL IMPORTANT										EXTREMELY IMPORTANT	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		2	1	3	5	6	18	10	13	15	8	19	6.7
Pub 97		4	1	5	5	8	15	11	14	14	6	17	6.3
Pub 95		3	2	5	7	6	18	10	14	13	4	18	6.2
Pub 93		4	3	5	7	7	18	10	15	12	5	16	6.1
Sci 97		2	5	8	10	6	12	13	13	14	12	6	5.8
Leg 97		1	2	4	6	7	10	13	17	17	12	11	6.6
UCS 93		9	11	13	11	5	10	10	12	9	5	5	4.5
Labs 93		1	4	8	7	4	7	11	18	19	11	10	6.4

('93: INFLU-49) ('95: B26/Influ) ('97: P1-16/Influ) [99-97: p = .0001; 99-93: p <.0001]

Q17/Status How important are US nuclear weapons for maintaining US status as a world leader?

	%	NOT AT ALL IMPORTANT										EXTREMELY IMPORTANT	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		3	1	2	3	6	13	8	13	15	10	26	7.1
Pub 97		4	2	4	5	7	12	9	13	15	7	22	6.6
Pub 95		4	3	4	5	5	15	8	14	14	6	24	6.7
Pub 93		3	4	5	6	7	15	8	16	11	6	19	6.3
Sci 97		3	5	10	10	6	11	11	12	15	12	7	5.7
Leg 97		1	2	5	6	6	9	11	16	17	15	12	6.7
UCS 93		13	12	12	11	7	10	9	10	7	3	4	4.1
Labs 93		2	4	6	8	4	9	11	17	16	12	11	6.3

('93: STATUS-50) ('95: B27/Status) ('97: P1-17/Status) [99-97: p <.0001; 99-93: p <.0001]

Q18/Sprpwr How important is it for the US to remain a military superpower?

	%	NOT AT ALL IMPORTANT										EXTREMELY IMPORTANT	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		1	1	1	1	2	6	4	8	13	12	51	8.5
Pub 97		1	1	2	2	3	6	6	9	14	11	46	8.2
Pub 95		2	2	1	3	2	9	6	12	13	7	44	7.9
Pub 93		1	2	2	3	3	8	7	15	10	8	39	7.6
Sci 97		1	1	3	4	4	7	9	14	17	21	19	7.4
Leg 97		0	1	1	2	4	3	6	9	14	18	41	8.3
UCS 93		10	6	8	9	5	8	12	14	11	7	11	5.3
Labs 93		1	1	2	3	2	5	6	13	18	18	31	7.9

('93: SPRPWR-51) ('95: B28/Sprpwr) ('97: P1-18/Sprpwr) [99-97: p = .0013; 99-93: p <.0001]

Q19/Amway · How important have nuclear weapons been to preserving America's way of life?

		<u>NOT AT ALL IMPORTANT</u>										<u>EXTREMELY IMPORTANT</u>		
		%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99		4	2	4	6	5	15	9	12	14	7	20	6.5
Pub	97		6	2	5	6	7	14	9	13	15	6	18	6.3
Pub	95		5	3	4	6	7	15	9	12	14	5	20	6.3
Pub	93		4	4	5	7	7	15	9	13	15	6	15	6.1
Sci	97		4	4	9	7	6	11	9	14	14	12	10	5.9
Leg	97		2	2	4	6	6	10	11	13	16	16	14	6.7
UCS	93		15	10	11	8	5	11	9	12	9	5	5	4.3
Labs	93		2	2	3	4	2	5	7	14	19	20	22	7.5

('93: AMWAY-70) ('95: B36/Amway) ('97: P1-19/Amway)

[99-97: p = .0740; 99-93: p = .0003]

Q20/Pdeter The next three questions ask about your perceptions of nuclear deterrence, which means: preventing someone from using nuclear weapons against us, because they expect that we would retaliate by using nuclear weapons against them. First, using the same scale where zero is *not at all important*, and ten is *extremely important*, how important was nuclear deterrence in preventing nuclear conflict during the Cold War?

		<u>NOT AT ALL IMPORTANT</u>										<u>EXTREMELY IMPORTANT</u>		
		%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99		2	1	1	2	3	11	7	11	18	12	31	7.7
Pub	97		2	1	1	2	4	10	9	11	19	10	31	7.6
Pub	95		1	1	1	2	3	10	7	13	16	9	36	7.8
Sci	97		1	1	2	2	2	5	8	16	20	24	19	7.7
Leg	97		0	1	1	3	3	6	6	12	18	26	23	7.9

('95: B33/Pdeter) ('97: P1-20/Pdeter)

[99-97: p = .7545; 99-95: p = .1025]

Q21/Ndeter Again, using the same zero to ten scale, how important are US nuclear weapons for preventing other countries from using nuclear weapons against us today?

		<u>NOT AT ALL IMPORTANT</u>										<u>EXTREMELY IMPORTANT</u>		
		%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99		1	1	2	3	4	10	7	12	19	11	31	7.7
Pub	97		2	1	2	3	4	11	9	11	18	11	29	7.4
Pub	95		2	1	2	3	3	10	8	13	16	8	34	7.6
Sci	97		1	2	3	6	4	8	8	15	18	20	16	7.1
Leg	97		0	1	2	3	4	6	8	13	19	22	21	7.6

('95: B34/Ndeter) ('97: P1-21/Ndeter)

[99-97: p = .0057; 99-95: p = .4044]

Q22/Fdeter For this question, zero means *not at all effective*, and ten means *extremely effective*. If more countries acquire nuclear weapons in the future, how effective will nuclear deterrence be in preventing nuclear wars from occurring anywhere in the world?

	NOT AT ALL EFFECTIVE										EXTREMELY EFFECTIVE		
	%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		6	3	5	8	8	16	8	12	13	6	16	5.9
Pub 97		7	2	5	8	7	15	7	11	14	5	18	6.0
Pub 95		7	4	4	7	6	16	8	13	12	4	20	6.0
Sci 97		2	5	9	11	8	11	9	17	13	10	5	5.6
Leg 97		2	5	7	10	9	11	9	11	15	12	10	5.9

('95: B35/Fdeter) ('97: P1-22/Fdeter)

[99-97: p = .4923; 99-95: p = .5257]

Q23/DetC/B Now we want you to think about preventing the use of chemical and biological weapons against the US today. Using a scale where zero means *not at all important*, and ten means *extremely important*, how important are US nuclear weapons for preventing other countries from using chemical or biological weapons against us today?

	NOT AT ALL IMPORTANT										EXTREMELY IMPORTANT		
	%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		5	2	5	6	5	11	9	11	15	9	22	6.6

Q24/Reduce Under the terms of arms reductions agreements, the US and Russia are reducing their stockpiles of nuclear weapons. Recent published reports estimate that the US and Russia each have between 6,000 and 7,000 strategic warheads deployed today. For this question, assume that 7,000 is the maximum number and zero is the minimum. If mutual reductions in the number of US and Russian nuclear weapons can be verified, to approximately what level would you be willing to reduce the number of US nuclear weapons?

%	7,000 – 6,501	6,500 – 6,001	6,000 – 5,501	5,500 – 5,001	5,000 – 4,501	4,500 – 4,001	4,000 – 3,501	3,500 – 3,001
Pub 99	11	1	4	1	11	1	7	6
Pub 97	11	1	2	0	11	1	6	7
Sci 97	3	0	1	1	4	1	3	7
Leg 97	10	2	2	3	9	1	6	13

%	3,000 – 2,501	2,500 – 2,001	2,000 – 1,501	1,500 – 1,001	1,000 – 501	500 – 1	–0–	MEDIAN
Pub 99	5	1	7	0	9	16	20	2,000-1,501
Pub 97	7	2	7	1	8	17	21	2,000 – 1,501
Sci 97	6	6	7	11	21	21	7	1,500 – 1,001
Leg 97	10	5	6	8	10	11	6	3,000 – 2,501

('97: P1-23/Reduce)

If China does not enter into arms control agreements to reduce the number of its nuclear weapons, how would that influence your views about US reductions? Please respond to the following two statements about China using a scale from one to seven where one means *strongly disagree*, and seven means *strongly agree*.

Q25/PRC1 The number of China's nuclear weapons should not influence the number of US nuclear weapons.

	STRONGLY DISAGREE						STRONGLY AGREE		MEAN
	%	1	2	3	4	5	6	7	
Pub 99		40	9	7	5	9	8	23	3.5
Pub 97		38	8	6	6	10	7	24	3.6
Sci 97		34	28	14	8	7	6	4	2.6
Leg 97		48	22	10	7	4	5	5	2.3

('97: P1-24/PRC1)

[99-97: p = .2143]

Q26/PRC2 The US should not reduce below the number of nuclear weapons that China maintains.

	STRONGLY DISAGREE						STRONGLY AGREE		MEAN
	%	1	2	3	4	5	6	7	
Pub 99		14	4	6	5	8	9	54	5.3
Pub 97		15	5	5	7	10	8	50	5.2
Sci 97		4	6	9	13	11	20	37	5.3
Leg 97		3	5	7	10	9	18	49	5.7

('97: P1-25/PRC2)

[99-97: p = .0645]

The next three questions address arms control more broadly. Each uses a scale from one to seven where one means *strongly oppose*, and seven means *strongly support*.

Q27/CTBT First, how do you feel about the US participating in a treaty that bans all nuclear test explosions?

	STRONGLY OPPOSE						STRONGLY SUPPORT		MEAN
	%	1	2	3	4	5	6	7	
Pub 99		13	3	5	6	11	13	49	5.3
Pub 97		12	4	5	7	10	11	52	5.4
Pub 95		6	5	3	15	13	11	46	5.4
Sci 97		3	4	4	7	11	28	42	5.7
Leg 97		7	7	7	15	15	23	25	4.9

('95: B37/CTBT used 0-10 scale; converted to 1-7 scale above) ('97: P1-26)

[99-97: p = .5774; 99-95: p = .1893]

Q28/FMC On the same one to seven scale, how do you feel about the US participating in a treaty that bans production of nuclear materials that could be used to make nuclear weapons?

%	STRONGLY OPPOSE						STRONGLY SUPPORT		MEAN
	1	2	3	4	5	6	7		
Pub 99	11	5	6	8	12	13	46	5.3	
Pub 97	12	4	7	8	11	11	46	5.2	
Pub 95	6	6	4	16	16	10	43	5.3	
Sci 97	6	8	6	10	15	25	31	5.2	
Leg 97	9	11	9	14	15	22	19	4.6	

('95: B38/FMC used 0-10 scale; converted to 1-7 scale above) ('97: P1-27/FMC)
[99-97: P = .2418; 99-95: p = .7370]

Q29/Disarm Again, using the same scale from one to seven, how do you feel about the US agreeing to a provision that requires us to eventually eliminate all of our nuclear weapons?

%	STRONGLY OPPOSE						STRONGLY SUPPORT		MEAN
	1	2	3	4	5	6	7		
Pub 99	25	8	7	8	10	9	32	4.3	
Pub 97	23	8	9	7	10	8	35	4.4	
Pub 95	12	12	7	18	12	7	32	4.6	
Sci 97	17	15	10	11	12	14	21	4.1	
Leg 97	28	17	12	10	11	9	13	3.4	

('95: B39/Disarm used 0-10 scale; converted to 1-7 scale above) ('97: P1-28/Disarm)
[99-97: p = .1541; 99-95: p = .0001]

Now using a one to seven scale where one means you *strongly disagree*, and seven means you *strongly agree*, please respond to the following two statements.

Q30/Nonucs It is feasible to eliminate all nuclear weapons worldwide within the next 25 years.

%	STRONGLY DISAGREE						STRONGLY AGREE		MEAN
	1	2	3	4	5	6	7		
Pub 99	33	10	9	8	12	5	23	3.6	
Pub 97	31	11	9	6	11	6	26	3.8	
Pub 95	26	9	10	9	13	8	24	4.0	
Pub 93	29	14	8	6	11	7	25	3.8	
Sci 97	24	25	12	8	12	10	8	3.2	
Leg 97	30	21	13	12	10	8	6	3.0	
UCS 93	16	20	11	10	12	16	15	3.9	
Labs 93	49	25	9	5	6	4	3	2.2	

('93: NONUCS-41) ('95: C3/Nonucs) ('97: P1-29/Nonucs) [99-97: p = .2242; 99-93: p = .1446]

Q31/Future Even if all the nuclear weapons could somehow be eliminated worldwide, it would be extremely difficult to keep other countries from building them again.

%	STRONGLY DISAGREE						STRONGLY AGREE		MEAN
	1	2	3	4	5	6	7		
Pub 99	7	2	3	3	8	15	61	5.9	
Pub 97	8	4	2	4	11	14	58	5.8	
Pub 95	5	2	3	6	14	17	52	5.8	
Pub 93	5	3	3	4	12	16	56	5.9	
Sci 97	1	4	3	6	17	35	35	5.8	
Leg 97	1	3	4	5	14	30	44	5.9	
UCS 93	3	7	6	7	20	32	25	5.3	
Labs 93	1	1	1	2	10	35	50	6.2	

('93: FUTURE-42) ('95: C4/Future) ('97: P1-30/Future)

[99-97: p = .0275; 99-93: p = .4292]

Q32/Retain On a scale from zero to ten where zero is *not at all important*, and ten is *extremely important*, how important is it for the US to retain nuclear weapons today?

%	NOT AT ALL IMPORTANT										EXTREMELY IMPORTANT		MEAN
	0	1	2	3	4	5	6	7	8	9	10		
Pub 99	2	2	1	3	3	9	9	14	15	7	34	7.5	
Pub 97	3	1	2	3	4	14	7	18	13	5	30	7.2	
Pub *95	7	0	6	10	0	11	0	18	12	0	36	6.8	
Pub *93	6	0	6	11	0	14	0	20	13	0	30	6.6	
Sci 97	1	2	4	3	3	6	8	15	19	20	20	7.4	
Leg 97	1	1	3	3	3	4	6	14	19	16	30	7.8	
UCS *93	15	17	0	16	0	15	16	0	12	0	8	4.5	
Labs *93	1	4	0	6	0	8	12	0	29	0	41	7.9	

('93: RETAIN-24) ('95: B21/Retain) ('97: P1-31/Retain) *In 1993 and 1995, answers to this question were provided on a 1-7 scale. Results were converted to 0-10 scale for above comparisons.

[99-97: p = .0015; 99-93: p <.0001]

Q33/Tanks Using a scale from one to seven where one means you *strongly disagree*, and seven means you *strongly agree*, please respond to the following statement. "Having a nuclear arsenal means the US can spend less for national defense than would be necessary without nuclear weapons."

%	STRONGLY DISAGREE						STRONGLY AGREE		MEAN
	1	2	3	4	5	6	7		
Pub 99	21	10	10	11	17	11	19	4.0	
Pub 97	20	9	10	11	18	10	22	4.1	
Pub 95	25	11	11	13	15	9	15	3.7	
Pub 93	24	15	15	12	17	9	9	3.4	
Sci 97	15	25	13	15	14	10	8	3.5	
Leg 97	12	21	12	17	16	15	8	3.8	
UCS 93	38	30	10	9	7	3	3	2.4	
Labs 93	23	31	14	8	13	9	4	3.0	

('93: TANKS-58) ('95: B30/Tanks) ('97: P1-32/Tanks)

[99-97: p = .1315; 99-93: p <.0001]

The next two questions deal with the economic value of defense industry jobs and defense related technologies. For both, use a one to seven scale where one means *little economic value*, and seven means *great economic value*.

Q34/Jobs First, how do you rate the economic value of defense industry jobs in America?

	LITTLE ECONOMIC VALUE					GREAT ECONOMIC VALUE			MEAN
	%	1	2	3	4	5	6	7	
Pub 99		4	3	7	13	28	21	25	5.2
Pub 97		4	3	8	14	28	18	25	5.1
Pub 95		7	6	10	17	23	14	23	4.8
Pub 93		7	9	13	15	23	15	18	4.6
Sci 97		4	9	8	16	32	25	7	4.7
Leg 97		1	4	6	15	31	28	15	5.1
UCS 93	26		29	17	10	9	6	2	2.7
Labs 93		4	8	12	14	27	27	9	4.7

('93: JOBS-59) ('95: B31/Jobs) ('97: P1-33/Jobs)

[99-97: p = .1497; 99-93: p <.0001]

Q35/Tectran Next, how do you rate the economic value of technological advances in defense industries for other areas of the US economy?

	LITTLE ECONOMIC VALUE					GREAT ECONOMIC VALUE			MEAN
	%	1	2	3	4	5	6	7	
Pub 99		2	2	4	9	22	25	37	5.7
Pub 97		2	2	4	9	24	23	35	5.6
Pub 95		4	3	8	13	24	19	30	5.3
Pub 93		NA	NA	NA	NA	NA	NA	NA	NA
Sci 97		1	7	7	12	26	31	16	5.1
Leg 97		0	2	4	8	21	40	26	5.7
UCS 93		5	18	17	17	24	15	4	4.0
Labs 93		1	5	5	9	26	38	17	5.4

('93: TECTRAN-91, UCS and Labs only) ('95: B32/Tectran) ('97: P1-34/Tectran)

[99-97: p = .1023; 99-95: p <.0001]

Next we want your views about spending priorities. Please indicate how you think government spending on nuclear weapons issues should change in each of the following areas. Use a scale from one to seven where one means spending should *substantially decrease*, and seven means spending should *substantially increase*.

Q36/Devtest First, how should government spending change for developing and testing new nuclear weapons?

%	SUBSTANTIALLY DECREASE					SUBSTANTIALLY INCREASE		MEAN
	1	2	3	4	5	6	7	
Pub 99	18	14	19	19	18	5	7	3.4
Pub 97	25	16	20	15	13	3	7	3.1
Pub 95	44	14	14	10	9	2	7	2.6
Pub 93	40	16	12	9	11	3	8	2.8
Sci 97	22	33	18	19	5	2	0	2.6
Leg 97	10	21	21	31	13	2	1	3.3
UCS 93	74	17	5	3	1	0	0	1.4
Labs 93	16	25	23	23	9	3	1	3.0

('93: DEV/TEST-13) (B10/Devtest) ('97: P1-35/Devtest)

[99-97: p <.0001; 99-93: p <.0001]

Q37/Mtain Maintaining existing nuclear weapons in reliable condition?

%	SUBSTANTIALLY DECREASE					SUBSTANTIALLY INCREASE		MEAN
	1	2	3	4	5	6	7	
Pub 99	6	4	10	15	21	16	29	5.0
Pub 97	10	6	12	15	20	15	22	4.6
Pub 95	17	6	12	14	17	11	24	4.4
Pub* 93	12	6	13	15	19	10	25	4.5
Sci 97	4	9	13	37	21	13	3	4.1
Leg 97	3	5	10	32	28	15	5	4.4
UCS* 93	28	26	21	18	5	1	1	2.6
Labs* 93	3	6	13	40	24	11	3	4.2

('93: MTAIN-14) ('95: B11/Mtain) ('97: P1-36/Mtain)

[99-97: p <.0001; 99-93: p <.0001]

* Wording in 1993: "Maintenance of existing nuclear weapons?"

Q38/Safwpn Research to increase the safety of existing nuclear weapons?

%	SUBSTANTIALLY DECREASE					SUBSTANTIALLY INCREASE		MEAN
	1	2	3	4	5	6	7	
Pub 99	4	2	4	7	15	16	52	5.8
Pub 97	5	2	5	9	14	17	47	5.6
Pub 95	11	4	7	7	14	12	45	5.2
Pub 93	8	3	8	10	17	14	40	5.2
Sci 97	2	5	7	21	29	24	12	4.9
Leg 97	1	2	5	18	30	27	17	5.2
UCS 93	14	12	14	23	16	12	10	3.9
Labs 93	2	4	9	22	31	22	9	4.8

('93: SAFWPN-15) (B12/Safwpn) ('97: P1-37/Safwpn)

[99-97: p = .0025; 99-93: p <.0001]

Q39/Tng Training to assure competence of those who manage US nuclear weapons?

%	SUBSTANTIALLY DECREASE				SUBSTANTIALLY INCREASE			MEAN
	1	2	3	4	5	6	7	
Pub 99	3	1	2	5	12	13	64	6.2
Pub 97	3	1	2	7	11	14	60	6.0
Pub 95	8	2	3	6	10	10	61	5.8
Pub 93	6	2	4	8	14	13	52	5.7
Sci 97	1	1	4	22	26	27	19	5.3
Leg 97	1	0	5	17	29	26	22	5.4
UCS 93	3	3	7	27	20	19	21	5.0
Labs 93	0	1	3	30	31	24	11	5.1

('93: TNG-16) ('95: B13/Tng) ('97: P1-38/Tng)

[99-97: p = .0135; 99-93: p <.0001]

Q40/Sustain Maintaining the ability to develop and improve US nuclear weapons in the future?

%	SUBSTANTIALLY DECREASE				SUBSTANTIALLY INCREASE			MEAN
	1	2	3	4	5	6	7	
Pub 99	10	7	9	13	20	13	28	4.8
Pub 97	13	9	12	13	19	10	24	4.4
Pub 95	23	8	11	12	16	8	22	4.0
Pub 93	23	12	16	12	14	8	16	3.7
Sci 97	6	13	12	27	24	14	5	4.1
Leg 97	4	8	10	21	30	18	9	4.5
UCS 93	41	23	14	14	6	1	1	2.3
Labs 93	5	7	11	28	25	17	7	4.4

('93: SUSTAIN-17) ('95: B14/Sustain) ('97: P1-39/Sustain)

[99-97: p <.0001; 99-93: p <.0001]

Q41/Prolif Preventing the spread of nuclear weapons?

%	SUBSTANTIALLY DECREASE				SUBSTANTIALLY INCREASE			MEAN
	1	2	3	4	5	6	7	
Pub 99	6	2	3	5	9	12	62	5.9
Pub 97	9	2	3	6	10	13	57	5.7
Pub 95	18	3	3	5	9	10	52	5.2
Pub 93	14	4	5	6	12	12	46	5.2
Sci 97	1	1	2	10	22	32	33	5.8
Leg 97	1	2	3	13	21	30	31	5.6
UCS 93	1	0	1	4	6	22	65	6.4
Labs 93	0	1	1	8	19	36	36	5.9

('93: PROLIF-18) ('95: B15/Prolif) ('97: P1-40)

[99-97: p = .0027; 99-93: p <.0001]

Q42/Terror Preventing nuclear terrorism?

%	SUBSTANTIALLY DECREASE				SUBSTANTIALLY INCREASE				MEAN
	1	2	3	4	5	6	7		
Pub 99	4	1	1	3	5	9	76	6.3	
Pub 97	7	1	1	3	6	9	73	6.2	
Pub 95	13	2	1	2	5	7	69	5.8	
Pub 93	7	2	4	5	8	12	61	5.8	
Sci 97	1	1	1	6	14	30	48	6.1	
Leg 97	0	1	1	5	12	27	54	6.2	
UCS 93	1	1	1	7	11	22	57	6.2	
Labs 93	0	0	1	6	17	31	45	6.1	

('93: TERROR-19) ('95: B16/Terror) ('97: P1-41/Terror) [99-97: p = .0152; 99-93: p <.0001]

On a scale from zero to ten where zero means *no trust*, and ten means *complete trust*, how much do you trust the following organizations to safely manage nuclear resources such as nuclear weapons or radioactive materials?

[Note: The order of questions 43–46 was randomized.]

Q43/DoD The Department of Defense?

%	NO TRUST						COMPLETE TRUST						MEAN
	0	1	2	3	4	5	6	7	8	9	10		
Pub 99	5	4	6	6	7	17	12	18	12	5	8	5.7	
Pub 97	6	4	5	8	6	18	12	18	10	5	7	5.5	
Pub 95	5	6	6	10	8	21	11	14	9	2	7	5.2	
Sci 97	2	4	5	6	6	13	11	16	22	11	3	6.1	
Leg 97	1	3	4	3	5	11	11	23	23	11	5	6.5	

('95: C35/DOD) ('97: P1-42/DoD) [99-97: p = .1207; 99-95: p <.0001]

Q44/Util Public utility companies?

%	NO TRUST						COMPLETE TRUST						MEAN
	0	1	2	3	4	5	6	7	8	9	10		
Pub 99	10	8	10	13	11	21	9	9	5	2	3	4.2	
Pub 97	10	8	9	13	11	20	10	10	5	1	4	4.2	
Pub 95	8	11	8	14	13	18	8	10	6	1	4	4.2	
Sci 97	5	5	12	12	10	14	12	14	11	5	1	4.8	
Leg 97	5	5	7	8	9	15	16	15	14	6	1	5.2	

('95: C36/Util) ('97: P1-43/Util) [99-97: p = .7645; 99-95: p = .7877]

Q45/DOE The Department of Energy?

%	NO TRUST						COMPLETE TRUST						MEAN
	0	1	2	3	4	5	6	7	8	9	10		
Pub 99	6	5	5	9	11	21	13	13	10	3	5	5.1	
Pub 97	6	4	6	9	9	22	12	15	8	3	5	5.1	
Pub 95	5	6	7	11	11	22	11	12	8	2	5	4.9	
Sci 97	3	3	6	9	7	16	13	18	17	7	1	5.6	
Leg 97	3	4	7	7	11	17	12	18	13	5	1	5.3	

('95: C37/DoE) ('97: P1-44/DOE) [99-97: p = .9826; 99-95: p = .0259]

Q46/Labs National laboratories?

	%	NO TRUST										COMPLETE TRUST	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		6	5	4	9	10	24	12	14	10	2	4	5.1
Pub 97		6	4	5	9	10	24	14	13	9	3	4	5.1
Pub 95		5	5	5	10	11	23	13	14	8	2	5	5.1
Sci 97		1	2	4	5	6	11	12	18	22	16	3	6.5
Leg 97		2	2	5	7	7	17	12	17	20	8	2	5.9

('95: C38/Labs) ('97: P1-45/Labs)

[99-97: p = .7974; 99-95: p = .9103]

Now we want your overall assessment of current and future threats to the US from two sources.

Q47/Rusnow First, on a scale from zero to ten where zero means *no threat*, and ten means *extreme threat*, how would you rate the *current* threat to the US posed by Russia's nuclear weapons?

	%	NO THREAT										EXTREME THREAT	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		4	4	8	11	13	22	9	11	8	2	8	5.1
Pub 97		5	4	11	14	12	19	9	9	8	2	7	4.8
Sci 97		2	8	21	18	9	14	11	10	5	1	0	4.0
Leg 97		1	5	12	18	13	16	15	11	6	2	1	4.6

('97: P1-46/Rusnow)

[99-97: p = .0002]

Q48/PRCnow Next, using the same scale where zero means *no threat*, and ten means *extreme threat*, how would you rate the *current* threat to the US from China's nuclear weapons?

	%	NO THREAT										EXTREME THREAT	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		2	2	4	6	8	15	13	16	15	7	13	6.3
Pub 97		3	2	5	8	8	19	13	16	11	5	10	5.8
Sci 97		2	8	15	15	11	13	13	11	8	3	1	4.5
Leg 97		1	2	8	12	9	15	17	15	11	5	5	5.5

('97: P1-47/PRCnow)

[99-97: p <.0001]

Q49/Rus+10 Turning now to your outlook for the future, and using the same zero to ten scale, how would you rate the threat to the US in the *next ten years* from Russia's nuclear weapons?

	%	NO THREAT										EXTREME THREAT	
		0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99		4	3	10	12	12	19	10	10	8	3	8	5.1
Pub 97		6	5	11	15	11	21	8	8	6	3	7	4.7
Sci 97		3	12	20	17	12	14	9	8	4	1	0	3.8
Leg 97		1	7	14	16	11	17	14	11	5	2	1	4.4

('97: P1-48/Rus+10)

[99-97: p <.0001]

Q50/PRC+10 On the same scale, how would you rate the threat to the US in the *next ten years* from China's nuclear weapons?

	NO THREAT											EXTREME THREAT	
	%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99	2	2	4	5	7	15	12	16	13	8	16	6.5	
Pub 97	3	3	5	8	8	17	13	14	12	6	11	5.8	
Sci 97	1	5	9	13	11	15	13	14	12	5	2	5.2	
Leg 97	0	2	6	10	9	11	14	18	14	10	6	6.0	

('97: P1-49/PRC+10)

[99-97: p <.0001]

As shown in the Persian Gulf War and more recently in Yugoslavia, precision guided munitions, often called smart bombs, can be delivered very accurately by airplanes and cruise missiles. Some people argue that smart bombs that do NOT have nuclear warheads can take the place of nuclear weapons for the purpose of preventing attacks against the US. Others disagree, arguing that nothing except our own nuclear weapons can reliably prevent others from using nuclear weapons against us.

Using a zero to ten scale where zero means *not at all effective*, and ten means *extremely effective*, how effective do you think US smart bombs are for deterring an adversary from using nuclear weapons against each of the following?

Q51/N-Home The US homeland?

	NOT AT ALL EFFECTIVE											EXTREMELY EFFECTIVE	
	%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99	7	4	6	7	7	16	10	14	12	5	11	5.6	

Q52/N-Forces US forces stationed overseas?

	NOT AT ALL EFFECTIVE											EXTREMELY EFFECTIVE	
	%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99	6	3	6	6	7	17	13	12	13	6	10	5.7	

Q53/N-Allies US allies such as Japan?

	NOT AT ALL EFFECTIVE											EXTREMELY EFFECTIVE	
	%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub 99	7	3	6	7	8	22	11	13	10	4	8	5.3	

Now we want to switch the comparison to biological weapons such as germs and viruses. Continuing the same zero to ten scale where zero means *not at all effective*, and ten means *extremely effective*, how effective do you think US smart bombs are for deterring an adversary from using biological weapons against each of the following:

Q54/B-Home The US homeland?

		<u>NOT AT ALL EFFECTIVE</u>									<u>EXTREMELY EFFECTIVE</u>			
		%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99	11	6	7	9	9	15	7	12	11	4	9	5.0	

Q55/B-Forces US forces stationed overseas?

		<u>NOT AT ALL EFFECTIVE</u>									<u>EXTREMELY EFFECTIVE</u>			
		%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99	10	6	8	10	9	17	9	10	9	3	9	4.9	

Q56/B-Allies US allies such as Japan?

		<u>NOT AT ALL EFFECTIVE</u>									<u>EXTREMELY EFFECTIVE</u>			
		%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99	11	5	8	11	11	16	9	12	7	3	8	4.7	

Next we want you to consider deterring the use of chemical weapons such as poisonous gases and nerve agents. Again using the same zero to ten scale where zero means not at all effective, and ten means extremely effective, how effective do you think US smart bombs are for deterring an adversary from using chemical weapons against each of the following?

Q57/C-Home The US homeland?

		<u>NOT AT ALL EFFECTIVE</u>									<u>EXTREMELY EFFECTIVE</u>			
		%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99	12	6	7	9	8	14	9	13	10	4	9	5.0	

Q58/C-Forces US forces stationed overseas?

		<u>NOT AT ALL EFFECTIVE</u>									<u>EXTREMELY EFFECTIVE</u>			
		%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99	1.1	5	7	10	8	17	9	12	9	4	8	4.9	

Q59/C-Allies US allies such as Japan?

		<u>NOT AT ALL EFFECTIVE</u>									<u>EXTREMELY EFFECTIVE</u>			
		%	0	1	2	3	4	5	6	7	8	9	10	MEAN
Pub	99	12	5	7	11	9	17	10	11	7	3	7	4.7	

Q60/Replace Can smart bombs replace US nuclear weapons for deterring other countries from using their nuclear weapons against us? On a scale from zero to ten where zero means *not at all*, and ten means *completely*, to what degree, if any, do you think smart bombs can replace US nuclear weapons for purposes of deterrence?

%	NOT AT ALL										COMPLETELY		MEAN
	0	1	2	3	4	5	6	7	8	9	10		
Pub 99	17	8	8	8	10	17	9	8	9	2	5	4.2	

Q61/BMD Now we want to shift the discussion to defense against missile attacks. There is an ongoing debate about defending the US from attacks by long-range nuclear armed ballistic missiles. To the best of your knowledge, does the US currently have a defensive system for shooting down long-range ballistic missiles that have been launched against the US homeland?

NO	YES	DON'T KNOW	
Public 1999	26	63	10

Actually, we do NOT currently have any defenses that can shoot down long-range ballistic missiles. People opposed to national missile defenses say that they are not needed, because the threat of US nuclear retaliation will deter all missile launches against us except for those that are accidental. They argue that missile defenses cost too much, will not work, and will lead to another arms race.

People in favor of national missile defenses say that our government has a responsibility to protect us, and that it is both feasible and affordable to construct a limited missile defense system. They argue that such a system would defend against a few missiles launched accidentally or from an attack by a rogue state like North Korea.

[NOTE: The order of the pro and con arguments in the above lead-in were randomized so that approximately one-half of respondents heard the con argument first, and approximately one-half heard the pro argument first.]

Please respond to the following statements about missile defenses on a scale from one to seven where one means *strongly disagree*, and seven means *strongly agree*.

[NOTE: The order of questions 63–69 was randomized.]

Q63/FewMx A national ballistic missile defense system would reliably defend the US against accidental launches of small numbers of nuclear missiles against us.

%	STRONGLY DISAGREE					STRONGLY AGREE		MEAN
	1	2	3	4	5	6	7	
Pub 99	7	7	7	11	22	20	26	4.9

Q64/RogueMx A national ballistic missile defense system would reliably defend the US against small numbers of nuclear missiles launched by a rogue state like North Korea.

		<u>STRONGLY DISAGREE</u>					<u>STRONGLY AGREE</u>		
%		1	2	3	4	5	6	7	MEAN
Pub 99		7	5	8	10	22	20	27	5.0

Q65/GovBMD The US government has a responsibility to build a national ballistic missile defense system to protect us from attacks by nuclear missiles.

		<u>STRONGLY DISAGREE</u>					<u>STRONGLY AGREE</u>		
%		1	2	3	4	5	6	7	MEAN
Pub 99		8	4	6	10	17	16	39	5.3

Q66/BMDS Money to build a national ballistic missile defense system for the US would be better spent on other programs.

		<u>STRONGLY DISAGREE</u>					<u>STRONGLY AGREE</u>		
%		1	2	3	4	5	6	7	MEAN
Pub 99		19	10	12	14	16	9	20	4.1

Q67/LgBMD A national ballistic missile defense system would not be capable of protecting the US against a large-scale attack from nuclear missiles.

		<u>STRONGLY DISAGREE</u>					<u>STRONGLY AGREE</u>		
%		1	2	3	4	5	6	7	MEAN
Pub 99		11	8	12	14	19	15	20	4.5

Q68/RaceBMD A US national ballistic missile defense system would lead to a new arms race with Russia and China.

		<u>STRONGLY DISAGREE</u>					<u>STRONGLY AGREE</u>		
%		1	2	3	4	5	6	7	MEAN
Pub 99		17	13	11	14	19	11	15	4.0

Q69/RetalBMD The threat of US nuclear retaliation is sufficient to deter all long-range ballistic missile attacks against the US except for accidental launches.

		<u>STRONGLY DISAGREE</u>					<u>STRONGLY AGREE</u>		
%		1	2	3	4	5	6	7	MEAN
Pub 99		15	12	12	15	19	13	14	4.1

Q70/BuildBMD What is your overall preference about building a system to defend the US against attacks by long-range nuclear armed ballistic missiles? On a scale from one to seven where one means the US definitely should *not* build a national ballistic missile defense system, and seven means the US definitely *should* build such a system, what is your view?

%	DEFINITELY SHOULD NOT					DEFINITELY SHOULD		MEAN
	1	2	3	4	5	6	7	
Pub 99	8	5	6	12	19	16	34	5.1

The following questions ask for your views about using US nuclear weapons to retaliate against various types of attacks. Please respond to each using a one to seven scale where one means you *strongly oppose*, and seven means you *strongly support* the action.

Q71/NucUS How would you feel about the US using nuclear weapons to retaliate against a country that used nuclear weapons against the United States?

%	STRONGLY OPPOSE					STRONGLY SUPPORT		MEAN
	1	2	3	4	5	6	7	
Pub 99	7	5	5	7	12	16	49	5.5

Q72/NucTroops How would you feel about the US using nuclear weapons to retaliate against a country that used nuclear weapons against US troops that were deployed overseas?

%	STRONGLY OPPOSE					STRONGLY SUPPORT		MEAN
	1	2	3	4	5	6	7	
Pub 99	7	5	5	7	14	17	45	5.5

Q73/NucAllies How would you feel about the US using nuclear weapons to retaliate against a country that used nuclear weapons against a US ally such as Japan?

%	STRONGLY OPPOSE					STRONGLY SUPPORT		MEAN
	1	2	3	4	5	6	7	
Pub 99	13	7	10	14	24	13	19	4.4

Q74/NucResp How would you feel about the US using nuclear weapons to retaliate against a country that supported nuclear terrorism against the United States?

%	STRONGLY OPPOSE					STRONGLY SUPPORT		MEAN
	1	2	3	4	5	6	7	
Pub 99	15	7	6	10	14	15	33	4.8

Q75/Chem The US has stopped making chemical weapons and is destroying its remaining stocks. If another country used chemical weapons, such as poisonous gases or nerve agents, against our military forces, how would you feel about using nuclear weapons to retaliate?

%	STRONGLY OPPOSE					STRONGLY SUPPORT		MEAN
	1	2	3	4	5	6	7	
Pub 99	16	8	9	8	15	12	32	4.6

Q76/Bio The US has no biological weapons today. If another country used biological weapons, such as germs or viruses, against our military forces, how would you feel about using nuclear weapons to retaliate?

%	STRONGLY OPPOSE					STRONGLY SUPPORT		MEAN
	1	2	3	4	5	6	7	
Pub. 99	15	8	9	8	14	13	32	4.6

Some people think that retaliation with US nuclear weapons would be justified if another country used weapons of mass destruction against US forces. Others think that nuclear retaliation would not be justified, and that the US should respond with smart bombs that do NOT have nuclear warheads. Still others think that diplomacy rather than force should be the way the US reacts to such attacks. Each of the following questions asks how you think the US should respond if another country intentionally used weapons of mass destruction against US forces.

Q77/N-Atk If another country used *nuclear* weapons against US forces, which of the following three responses would you prefer?

PUBLIC 1999	%
A. Respond with diplomacy only; do not use force	12
B. Respond with smart bombs WITHOUT nuclear warheads	46
C. Respond with nuclear weapons	42

Q78/B-Atk If another country used *biological* weapons against US forces, which of the following three responses would you prefer?

PUBLIC 1999	%
A. Respond with diplomacy only; do not use force	10
B. Respond with smart bombs WITHOUT nuclear warheads	60
C. Respond with nuclear weapons	30

Q79/C-Atk If another country used *chemical* weapons against US forces, which of the following three responses would you prefer?

PUBLIC 1999	%
A. Respond with diplomacy only; do not use force	9
B. Respond with smart bombs WITHOUT nuclear warheads	60
C. Respond with nuclear weapons	31

For the next series, I will read several pairs of opposing statements, and I want you to tell me which statement you agree with the most. It's OK if you do not completely agree with either statement. I just need to know which statement you agree with the *most*.

[NOTE: The order of questions 80–89 was randomized, and the order of individual statements within each pair of contrasting statements was randomized.]

Q80/NWFwld These statements contrast views about the desirability of a world without nuclear weapons.

PUBLIC 1999	%
A. If all nuclear weapons were eliminated, the world would be safer, because wars would be less likely to destroy civilization.	69
B. If all nuclear weapons were eliminated, the world would be more dangerous, because large conflicts like World Wars I and II would be more likely.	31

Q81/ViewDet These statements contrast views about nuclear deterrence.

PUBLIC 1999	%
A. Nuclear deterrence is dangerous, unstable, and does not prevent war.	40
B. Nuclear deterrence is safe, stable, and prevents large conflicts like World Wars I and II.	60

Q82/Rsk-Bene These statements contrast views about risks and benefits of the US nuclear arsenal.

PUBLIC 1999	%
A. The US nuclear arsenal deters attacks and insures our security, and these <i>benefits</i> far outweigh any <i>risks</i> from US nuclear weapons.	73
B. The US nuclear arsenal threatens civilization and cannot be safely managed, and these <i>risks</i> far outweigh any <i>benefits</i> from US nuclear weapons.	27

Q83/Values These statements contrast views about US nuclear weapons and personal values.

PUBLIC 1999	%
A. US nuclear weapons <i>threaten</i> institutions that support freedom, self-determination, and human rights.	28
B. US nuclear weapons <i>protect</i> institutions that support freedom, self-determination, and human rights.	72

Q84/ViewSec These statements contrast views about world security today.

PUBLIC 1999	%
A. Today the world is a <i>less</i> dangerous place for the US than it was during the Cold War.	36
B. Today the world is a <i>more</i> dangerous place for the US than it was during the Cold War.	64

Q85/ViewElim These statements contrast views about eliminating nuclear weapons world-wide.

PUBLIC 1999	%
A. Eliminating all nuclear weapons worldwide can be achieved if the US sets the example and uses its influence to persuade other countries.	16
B. Eliminating all nuclear weapons worldwide cannot be achieved, because knowledge about them is too widespread, and the US cannot prevent others from acquiring them.	84

Q86/ViewFpol These statements contrast views about US foreign policy.

PUBLIC 1999	%
A. Unless it is directly attacked, the US should use military force only when it is authorized by the United Nations.	53
B. The US should use military force when the US thinks it's necessary, even if the United Nations does not authorize it.	47

Q87/ViewUse These statements contrast views about the uses of nuclear weapons.

PUBLIC 1999	%
A. US nuclear weapons have no use except for deterring others from using their nuclear weapons against us.	42
B. US nuclear weapons are useful both for deterring others from using their nuclear weapons against us and for winning wars if necessary.	58

Q88/MilPwr These statements contrast views about US military power.

PUBLIC 1999	%
A. US military power is <i>less</i> important today than it was during the Cold War.	28
B. US military power is <i>more</i> important today than it was during the Cold War.	72

Q89/Public These statements contrast views about the role of the public in determining the future of US nuclear weapons.

PUBLIC 1999	%
A. The debate about the future of the US nuclear arsenal should be left primarily to experts and elected officials in the US Congress.	35
B. The debate about the future of the US nuclear arsenal should be open equally to everyone, including the media, citizen groups, and individual citizens.	65

Now we need to ask a few general questions about you and your family. All the information will be kept strictly confidential.

Q90/Zip What is the zip code at your residence?

Q91/Reside Including yourself, how many people currently live at your residence?

Means		
Public	99	2.8
Public	97	2.7
Public	95	2.8
Public	93	2.8
Scientists	97	2.3
Legislators	97	2.9

('95: B62/Reside) ('93: FAMILY-163) ('97: P3-1/Reside)

Q92/Ovr18 How many of those are 18 years of age or older?

Means

Public	99	2.2
Public	97	2.2
Public	95	2.2
Scientists	97	1.8
Legislators	97	2.0

('95: B63/Ovr18) ('97: P3-2/Ovr18)

Q93/Phones How many different residential phone lines do you have in your household? By this we mean phones with different numbers, but do not include business lines or cellular phones.

Means

Public	99	1.3
Public	97	1.2
Public	95	1.2
Public	93	1.2

('93: PHONES-164) ('95: B71a/Phones) ('97: P3-Add/Phones)

Q94/Wkdays How many days a week do you work outside your home?

	%	0	1	2	3	4	5	6	7	MEAN
Pub	99	22	1	3	4	5	48	10	5	3.8
Pub	97	23	1	3	4	4	48	11	5	3.8
Pub	95	22	1	3	4	5	48	12	4	3.8
Sci	97	24	4	5	4	3	48	9	3	3.5
Leg	97	7	0	2	7	9	41	22	12	4.8

('95: B64/Wkdays) ('97:P3-3/Wkdays)

Q95/Age How old are you?

Means

Public	99	44.0
Public	97	44.3
Public	95	42.2
Public	93	42.3
Scientists	97	63.0
Legislators	97	52.4
UCS	93	52.8
Labs	93	43.7

('93: AGE-154) ('95: B55/Age) ('97: P3-4/Age)

Q96/Gend As part of the survey, I am required to ask: are you male or female??

	%	FEMALE	MALE
Public	99	56	44
Public	97	55	45
Public	95	54	46
Public	93	51	49
Scientists	97	8	92
Legislators	97	25	75
UCS	93	23	77
Labs	93	18	82

('93: GEND-157) ('95: B56/Gend) ('97: P3-5/Gend)

Q97/Race Which of the following best describes your race or ethnic background?

%	American Indian	Asian	Black	Hispanic	White non Hispanic	Other
Pub 99	2	2	7	5	79	4
Pub 97	2	1	6	4	81	5
Pub 95	2	2	7	4	79	6
Pub 93	2	2	6	4	84	2
Sci 97	0	5	1	1	92	1
Leg 97	0	1	3	2	92	2
UCS 93	0	1	1	1	94	1
Labs 93	0	4	0	3	89	2

('93: RACE-158) ('95: B61/Race) ('97: P3-6/Race)

Q98/Edu What is your highest level of education?

%	Pub 99	Pub 97	Pub 95	Pub 93	Sci 97	Leg 97	UCS 93	Labs 93
< High school graduate	5	7	6	6	0	0	0	0
High school graduate	25	27	28	24	0	2	3	0
Some college/voca. school	32	32	30	32	0	14	NA	NA
College graduate	22	18	20	20	1	26	9	12
Some graduate work	3	4	4	5	2	14	10	10
Master's degree	8	8	8	9	7	22	20	34
J.D. or higher law degree	1	1	NA	NA	0	15	NA	NA
Other doctorate	2	1	3	3	88	5	55	38
Other degree	1	1	NA	1	2	2	2	1

('93: EDUCA-151) ('95: B53/Edu) ('97: P3-7/Edu)

Q99/Income Please indicate which of the following income categories approximates the total estimated annual income for your *household* in 1998.

Median Ranges

Pub 99	Pub 97	Pub 95	Pub 93	Sci 97	Leg 97	UCS 93	Labs 93
\$40K-50K	\$40K – 50K	\$30K – 40K	\$35K – 40K	\$90K - 100K	\$70K – 80K	\$60K – 75K	\$75K – 90K

Q100/Ideol On a scale of political ideology, individuals can be arranged from strongly liberal to strongly conservative. Which of the following categories best describes your views?

%	STRONGLY LIBERAL		SLIGHTLY LIBERAL		MIDDLE OF THE ROAD	SLIGHTLY CONSERV		STRONGLY CONSERV	MEAN
	1	2	3	4	5	6	7		
Pub 99	4	13	8	29	17	20	8	4.4	
Pub 97	4	10	11	28	17	24	7	4.4	
Pub 95	2	10	11	28	21	20	7	4.5	
Pub 93	4	12	12	28	17	19	9	4.3	
Sci 97	4	20	19	18	18	18	2	3.9	
Leg 97	3	8	12	14	21	32	9	4.8	
UCS 93	18	42	21	10	6	3	0	2.6	
Labs 93	2	9	16	16	28	15	4	4.5	

(*93: IDEOL-148) (*95: B57/Ideol) (*97: P3-11/Ideol)

Q101/Party With which political party do you most identify?

%		DEMOCRAT	REPUBLICAN	INDEPENDENT	OTHER
		1	2	3	4
Public	99	47	41	6	6
Public	97	43	44	10	3
Public	95	37	37	23	3
Public	93	43	39	16	2
Scientists	97	47	30	21	2
Legislators	97	46	53	0	2
UCS	93	67	6	22	5
Labs	93	29	48	19	4

(*93: PARTY-149) (*95: B58/Party) (*97: P3-12/Party)

Q102/Iden Do you completely, somewhat, or slightly identify with that political party?

%		SLIGHTLY	SOMEWHAT	COMPLETELY	MEAN
		1	2	3	
Public	99	22	60	19	2.0
Public	97	21	61	18	2.0
Public	95	21	58	21	2.0
Public	93	18	55	26	2.1

(*93: PARTISAN-150) (*95: B59/Partisan) (*97: P3-Add/Iden)

Volume I References

- Allison, Graham, et al. 1993. *Cooperative Denuclearization: From Pledges to Deeds*. Cambridge, MA: Center for Science and International Affairs, Harvard University.
- The American Association for Public Opinion Research. 1998. *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for RDD Telephone Surveys and In-Person Household Surveys*. Ann Arbor, Michigan: AAPOR.
- Arian, Asher and Michal Shamir. 1983. "The Primarily Political Functions of the Left-Right Continuum." *Comparative Politics*, 15(2):139-58.
- Brown, Steven R. 1970. "Consistency and the Persistence of Ideology: Some Experimental Results." *Public Opinion Quarterly*, 34:60-68.
- Bundy, McGeorge, William J. Crowe, Jr., and Sidney D. Drell. 1993. *Reducing Nuclear Danger: The Road Away from the Brink*. New York: Council on Foreign Relations.
- Butler, Lee. 1999. "Zero Tolerance." *The Bulletin of the Atomic Scientists.*, 56(1):20-21, 72-75.
- Canberra Commission. 1996. *Report of the Canberra Commission on the Elimination of Nuclear Weapons*. Canberra: National Capital Printers.
- Carter, Ashton B. and William J. Perry. 1999. *Preventive Defense: A New Security Strategy for America*. Washington, DC: Brookings Institution Press.
- Committee on International Security and Arms Control, National Academy of Sciences. 1997. *The Future of U.S. Nuclear Weapons Policy*. Washington, DC: National Academy Press.
- Conover, Pamela Johnston and Stanley Feldman. 1981. "The Origins and Meaning of Liberal/Conservative Self-Identifications." *American Journal of Political Science*, 25(4):617-45.
- Conover, Pamela Johnston and Stanley Feldman. 1980. "Belief System Organization in the American Electorate." In *The Electorate Reconsidered*, John Pierce and John L. Sullivan, eds., Beverly Hills: SAGE.
- Coveyou, Michael R. and James Piereson. 1977. "Ideological Perceptions and Political Judgment: Some Problems of Concept and Measurement." *Political Methodology*, 4:77-102.
- Feiveson, Harold, ed. 1999. *The Nuclear Turning Point: A Blueprint for Deep Cuts and De-Alerting of Nuclear Weapons*. Washington DC: Brookings Institution Press.

- Feldman, Stanley. 1988. "Structure and Consistency in Public Opinion: The Role of Core Beliefs and Values." *American Journal of Political Science*, 32(2):416–40.
- Flournoy, Michèle A. 1993. *Nuclear Weapons After the Cold War: Guidelines for U.S. Policy*. New York: HarperCollins.
- Gahan, Celia and Mike Hannibal. 1998. *Doing Qualitative Research Using QSR NUD*IST*. Thousand Oaks, CA: SAGE Publications.
- Garwin, Richard L. 2000. "The Wrong Plan." *The Bulletin of the Atomic Scientists*, 56(2):36–41.
- Gormley, Dennis M. and Thomas G. Mahnken. 2000. "Facing Nuclear and Conventional Reality." *Orbis*. 44(1):109–125.
- Grogan, David Edward. 1999. "Power Play: Theater Ballistic Missile Defense, National Ballistic Missile Defense and the ABM Treaty." *Virginia Journal of International Law*, 39(4):799–879.
- Gronlund, Lisbeth and George Lewis. 1999. "How a Limited National Missile Defense Would Impact the ABM Treaty." *Arms Control Today*, 29(7):7–13.
- Herron, Kerry G. and Hank C. Jenkins-Smith. 1996. *Evolving Perceptions of Security: US National Security Surveys, 1993–1995*. Sandia Report: SAND96–1173. Albuquerque, NM: Sandia National Laboratories.
- Herron, Kerry G. and Hank C. Jenkins-Smith. 1998. *Public Perspectives on Nuclear Security: US National Security Surveys, 1993–1997*. Sandia Report: SAND98–1707. Albuquerque, NM: Sandia National Laboratories.
- Huber, John. 1989. "Values and Partisanship in Left–Right Orientations: Measuring Ideology." *European Journal of Political Research*, 17:599–621.
- Isaacs, John. 2000. "A Political Decision." *The Bulletin of the Atomic Scientists*, 56(2):22–25.
- Japzon, Eddie, Kris Swaminatha, and Michael Lee Moffit. 1999. *Program Manager*, January–February:51–53.
- Jenkins-Smith, Hank C., Richard P. Barke, and Kerry G. Herron. 1994. *Public Perspectives of Nuclear Weapons in the Post-Cold War Environment*. Sandia Report: SAND94–1265. Albuquerque, NM: Sandia National Laboratories.
- Kyle, Jon, United States Senator. 1999. "Setting Sail Toward a More Effective Missile Defense Strategy." *Comparative Strategy*, 18(3):221–24.

- Krepinevich, Andrew F. and Steven M. Kosiak. 1998. "Smarter Bombs, Fewer Nukes." *The Bulletin of Atomic Scientists*, 54(6).
- Lewis, George, Lisbeth Gronlund, and David Wright. 1999/2000. "National Missile Defense: An Indefensible System." *Foreign Policy*, 117(Winter):120–37.
- Lutbeg, Norman R. and Michael M. Gant. 1993. "The Failure of Liberal/Conservative Ideology as a Cognitive Structure." *Public Opinion Quarterly*, 49:80–93.
- Marcus, George, David Tabb, and John L. Sullivan. 1974. "The Application of Individual Differences Scaling to the Measurement of Political Ideology." *American Journal of Political Science*. 21:745–68.
- Mazarr, Michael J., ed.. 1997. *Nuclear Weapons in a Transformed World: The Challenge of Virtual Nuclear Arsenals*. New York: St. Martin's Press.
- Nance, Bill, Brigadier General. 1999. "An Update on National Missile Defense." *Comparative Strategy*, 18(3):239–43.
- National Missile Defense Review Committee Report. 1999. Text and analysis published in *Arms Control Today*, 29(7):14–20.
- Nitze, Paul H. 1994. "Is It Time To Junk Our Nukes?" *Washington Post*, January 16:C1.
- Nitze, Paul H. 1999. "A Threat Mostly to Ourselves." *New York Times*, October 28:A31.
- Norusis, Marija J. 1994. *SPSS Professional Statistics 6.1*. Chicago: SPSS Incorporated.
- Page, Benjamin I. and Robert Y. Shapiro. 1992. *The Rational Public: Fifty Years of Trends in Americans' Policy Preferences*. Chicago: University of Chicago Press.
- Payne, Keith B. 2000. "The Case for National Missile Defense." *Orbis*, 44(2):187–96.
- Peffley, Mark A. and Jon Hurwitz. 1985. "A Hierarchical Model of Attitude Constraint." *American Journal of Political Science*, 29(4):871–90.
- Postol, Theodore A. 2000. "The Target Is Russia." *The Bulletin of the Atomic Scientists*, 56(2):30–35.
- Rotblat, Joseph, Jack Steinberger, and Bhalchandra Udgaonkar, eds. 1993. *A Nuclear-Weapon-Free World: Desirable? Feasible?* Boulder, CO: Westview Press.
- Sabatier, Paul A. and Hank C. Jenkins-Smith. 1993. *Policy Change and Learning: An Advocacy Coalition Approach*. Boulder, CO: Westview Press.

- Sabatier, Paul A. and Hank C. Jenkins-Smith. 1999. "The Advocacy Coalition Framework: An Assessment." In *Theories of the Policy Process*, Paul A. Sabatier, ed., Boulder, CO: Westview Press.
- Schneider, Barry R. and William L. Dowdy. 1998. *Pulling Back from the Nuclear Brink: Reducing and Countering Nuclear Threats*. Portland, OR: Frank Cass Publishers.
- Spratt, John M., Jr., United States Congressman. 1999. "A Congressional Perspective on Ballistic Missile Defense." *Comparative Strategy*, 18(3):225-43.
- Stares, Paul B., ed. 1998. *The New Security Agenda: A Global Survey*. New York: Japan Center for International Exchange.
- Steinbruner, John. 1999. "National Missile Defense: Collision in Progress." *Arms Control Today*, 29(7):3-6.
- U.S. Bureau of the Census, Population Division. 1999a. *Resident Population Estimates of the United States by Age and Sex, April 1, 1990 to September 1, 1999*. Washington, DC: U.S. Government Printing Office.
- U.S. Bureau of the Census, Population Division. 1999b. Release P20-513. *Current Population Reports: Educational Attainment in the United States: March 1998 (Update)*. Washington, DC: U.S. Government Printing Office.
- U.S. Bureau of the Census, Population Division. 1999c. *Annual Population Estimates by Sex, Race and Hispanic Origin, Selected Years from 1990 to 1999*. Washington, DC: U.S. Government Printing Office.
- U.S. Bureau of the Census, Population Division. 1999d. Release P60-206. *Current Population Reports: Money Income in the United States: 1998*. Washington, DC: U.S. Government Printing Office.
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